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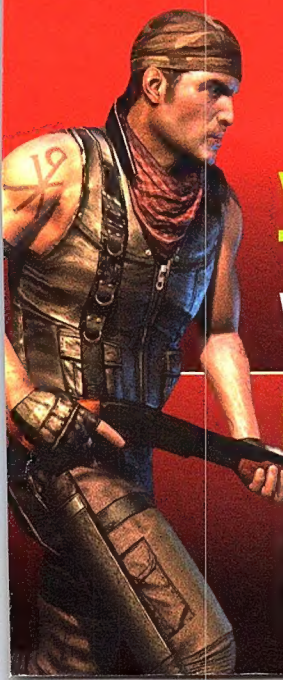
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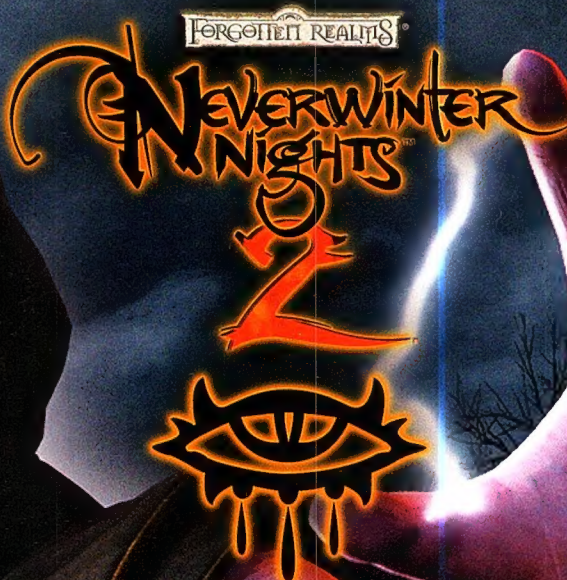
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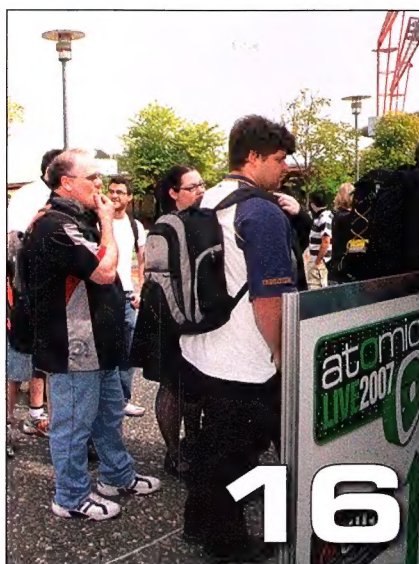
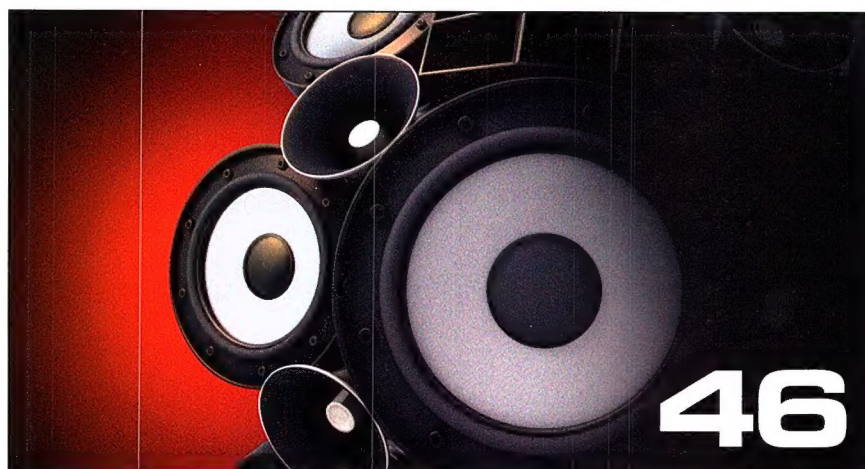
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# GIGABYTE

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## EDHEAD

## Very Atomic

Oh man, where do I start. Um... Hi, I'm David Hollingworth, and I'm the new editor of *Atomic*. So far so good.

I can't begin to describe the feelings in the office as I write this. On the one hand, *Atomic* is now blessed with a complete, and very fresh, very excited new crew. Josh Collins you all know and love already, of course, but we also have a new designer with us who is not only a dab hand with the old InDesign and Photoshop, but also an Atomicon to boot. He's another David, David West, but I think we're going to call him Dave to avoid any confusion.

That, or we rename Josh David.

While we're all pretty charged up about where we can take *Atomic*, it's also a very sad time, with Ben Mansill, the man who made this whole adventure possible, walking off into the sunset.

I said I'm new, but that's not entirely accurate - I was on the team when *Atomic* first started, but for less than a year. It meant that I got to see Ben at work first hand,

saw the belief he had in not only this magazine, but every single one of its readers.

Taking over these reins, from both Ben and the inestimable Logan Booker is not only a challenge, but an incredible honour.

But enough jibber-jabber, I've got a magazine to tout!

I'm very proud of this issue, and I think it's yet another uniquely *Atomic* masterpiece. Josh continues his explorations of everything hardcore with some serious hardware busting in the name of great reviewing, as well as bringing us all up to speed with the state of memory as DDR3 starts to take over the market.

Jake Carrol gets down and noisy with a soundcard roundup that not only pushes each card to its limit, but also looks at what sets each card apart for the discerning user. This is an article you need to read.

Logan Booker teaches us to turn the epic process of installing Vista into a ten minute novella, while Ron Prouse continues his nostalgic journey toward building the perfect home gaming cabinet.

Gaming-wise, it's a very exciting issue, as we have a very exciting look at the long awaited *Assassin's Creed*, as well as coming to grips with the cake-filled joy that is *The Orange Box*.

And, of course, a whole lot more. I hope you enjoy the ride - I certainly am.

**David Hollingworth**  
[dhollingworth@atomicmpc.com.au](mailto:dhollingworth@atomicmpc.com.au)

Issue 81 winners: 4 In-Win Xtreme F430 cases: *B Jennings*, Lenah Valley TAS, *S Reeved*, Arana Hills QLD, *I McKibbin*, Beverly SA, *J Colton*, Dunlop ACT, *M Vassallo*, Windsor Downs NSW. 3 Sound Blaster X-Fi Xtreme Audio Notebook cards: *B Stevens*, Mt Barker SA, *P Van Bruggen*, Melbourne VIC, *D Phillips*, Langwarrin VIC. Motorola S805 DJ headphones + Navipod iPod adaptor: *L Attwater*, Geraldton WA.

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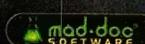
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# TECHTRENDS

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NVIDIA's minty green head office.

## California dreaming

Atomic's own Josh Collins recently got an up-close look at NVIDIA's Silicon Valley HQ. David Hollingworth reports.

**R**ight as we were going to print Josh Collins took a trip to the land of the big, where everything is one size larger and a meal isn't a good one unless you're still feeling it three hours later. That's right, Josh jetted off to the US of A.

His destination was the sunny corporate playground that is Silicon Valley, the home and birthplace of modern day computing – this place is, quite simply, the spiritual home of every geek world wide.

Constrained by a forth coming deadline, Josh had to make it quick – painfully quick. Flying in on the Wednesday the 24th October, getting to the hotel around midday, taking care of business on Thursday the 25th and then flying out on Friday the 26th in the evening. This trip was an exemplar of military precision.

So what was on the agenda? NVIDIA, as many of you are already well aware, was preparing itself

to release a new graphics card onto the market. Not any old card though, this card was not only a refresh of the G80 micro-architecture, welcoming in a new player code named G92, but this card is also destined to send a shock wave through the market the likes of which God has not seen. This card is the formidable 8800GT 512MB.

But that wasn't all that was revealed, NVIDIA has a host of gloriously NDA (Non-Disclosure Agreement) covered goodies that we'll be sharing with you as soon as we possibly can – certainly some neat things are happening at the jolly green camp.

All of Thursday 25th was taken up with NVIDIA sharing its up and coming news, goodies and even showing us a few hot game titles. Crysis looked obviously cool on the new hardware but also standing out was a new game called 'They' – stay tuned for news on this as we get it.

There was a number of individuals being shown around the NVIDIA HQ on the 25th, this included none other then Team Australia's own Dino 'dinos22' Strkljevic and Xtreme System's Charles 'Fugger' Wirth. These two well-known overclockers, and general top blokes, were Josh's crowd for much of the trip.

Getting a bit restless and wanting to see more of Silicon Valley, Josh, Charles and Dino hired a little Mazda3. Now with a ride it was time for them to check out some of the other manufacturers in the Silicon Valley area. First stop was Corsair.

After a quick phone call to let them know they were on their way, the trio of overclockers set off to Fremont from Santa Clara. Upon arrival the lads were greeted by Corsair's Applications Specialist George Makris and moments later met also by Senior Applications Specialist Robert Pearce.

The guys were ushered on a tour of the factory floor, where they witnessed the birth of many stacks of DDR2 and DDR3 Dominator modules, Nautilus water cooling units and HX620 power supplies.

From here, the guys went on to drop into NVIDIA again for a chat with Tom Peterson, Director MCP Technical Marketing, and Sean Cleveland, MCP Technical Marketing Manager. After a chat about some upcoming chipset lovin' the crew moved on to really push the time barrier and get a visit in at the Super Talent memory HQ and factory.

At Super Talent the guys were shown around a rather huge factory floor that was producing USB memory sticks, DDR2 modules, DDR3 modules and FB-DIMM modules. From here they were taken into another room and shown the product and performance test labs for their solid state disk drives (SSD) which they now have up to a capacity of 128GB – mmm, yum.

After a huge day out and about trekking up, down and all around Silicon Valley and two days of seeing the products bound for the enthusiast over the next couple months, the trio rushed back to the hotel to grab their bags and fly home. Thus ended the quick two night stop in the US for Josh before he could even get over the first bout of jet lag, let alone the dose he was to cop on the way home.

## SHORT CIRCUITS



**There are some things that are really hard to test physically, but also next to impossible to quantify without actually doing it.** Making sure that orbital craft can survive micro impacts and other nasty collisions is a serious business – so serious, that only the world's biggest BB gun is up to the challenge. The University of Dayton Research Institute, in the US, has just built a 45ft long 'gun' that can fire a pellet at roughly 20,500mph (that's over 32,000kph) into blocks of aluminium and composite spacecraft hulls.

**The tech world seems to be continually caught in a cycle of saying, first, that 'sure a drive with X capacity is enough', and then coming up with new ways to fill it to capacity in no time flat.** The rapacious need for ever more storage must be music to drive manufacturers' ears, and Seagates now added its new range of 7200.11 hard drives to shelves, ranging in capacities from 500GB to a massive 1TB. Initial reports suggest that while it is very quiet for its size, the performance of these giants is still not ideal.

**Speaking of hard drives, Western Digital** has just announced it has achieved the staggering storage density of 520GB per square inch. The announcement was made at the Perpendicular Magnetic Recording Conference in Tokyo. The breakthrough was achieved after five years' work in PMR/tunnelling magneto-resistive head technology, and pays off with a 3.5in drive that can store 640GB per platter. In other words, a single drive with up to 3TB of space. Does it echo in there?

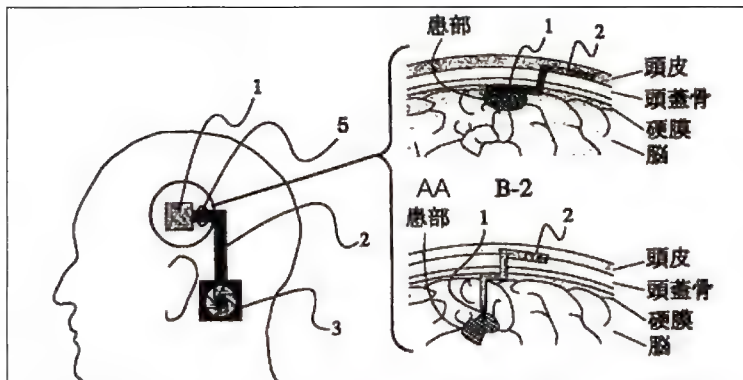
# Mod your head

David Hollingworth finds a way to beat the heat.

Takashi Saito and his brainy pals at Yamaguchi University have found a new application for the same kind of hardware we're more used to seeing in our souped up PCs – dealing with severe epileptic seizures.

A strong epileptic episode causes brain cells to randomly fire, and fast; so fast that the brain's temperature can actually increase, and make the epileptic symptoms even more severe, which in turn raises the temperature again, and so on, in a very nasty feedback loop. By surgically implanting a heat pipe into a sufferer's brain, then connecting that to an external heatsink mounted on the outside of the skull, Saito hopes that enough heat can be carried away from the brain to reduce the chances for future fits.

At last, a handy use for all the spare case fans and copper piping in any overclockers collection.



# The PS3 Heads for the Stars

There's a new use for the PS3.

David Hollingworth is not convinced.

Sony recently released yet another rosy batch of profit figures across practically all of its divisions. Except for entertainment, where the poor sales of the PlayStation 3 isn't doing the company any favours in either the console wars or the next gen video stakes. However, there's hope for the curvy black box yet.

The Gravity Grid is the brainchild of astrophysicist Dr. Gaurav Khanna, and is made up of eight interlinked PS3s running Linux. PS3's for science?



"To start with, the PS3 is an open platform, which essentially means that one can run different system software on it," says Dr Khanna on his project site (<http://gravity.phy.umassd.edu/ps3.html>). "This processor has a main CPU, called the PPU and several (six for the PS3) special compute engines, called SPUs available for raw computation," he goes on to say.

"Moreover, each SPU performs vector operations, which implies that it can compute on multiple data, in a single step."

And, of course, the big draw is that even eight PS3's are still cheaper and easier to come by than the grants Dr Khanna used to rely on just to rent time on a 'real' supercomputer.

And what is the Gravity Grid trying to simulate? The father of all geeks, Albert Einstein predicted that ripples in space time would propagate outward when a super-massive, but the question is how do we look for them, and what do we look for. Dr Khanna hopes that the PS3s in his lab can get us one step closer to understanding the mystery.

Skype and Logitech have joined forces to usher in a new standard for internet video, the creatively monickered High Quality Video. In the words of Logitech Australia's General Manager, George Saad, "High Quality Video takes all the promises of video calling and dramatically enhances the quality of the experience". The standard will boast VGA resolution and a solid 30 frames per second. Camwhores rejoice.

As we celebrated the eve of Atomic Live and waited anxiously for the Saturday on the night of Friday October 19th 2007, the overclocking

community bid farewell to one of its own. On that night, 21 year old Greek overclocker and member of the Hellas Overclocking Team (H.O.T.), known to many simply as Dom, was involved in a fatal car accident in Athens, Greece. He was on his way to an event that would play host to an amazing overclocking spectacle that included overclockers such as kngp|n, Shamino and hpro5 among others. In the name of Dom, his crew managed to break a bunch of world records including DMark06, 3DMark05 and Aquamark3. Rest in peace Dom, and may you enjoy cherry picked hardware with the big guy upstairs.

## POST OF THE MONTH

We like two things, here at Atomic - the drive to improve one's skills, and the desire to share those skills with all around. This month Kurai managed to do both, in style. Pleased with her recent purchase of a brand new graphics tablet, she wanted to get to grips with it as soon as possible, and offer her artistic services to anyone on the forum who wanted some custom art

Discover her clever and generous post here:

<http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=114651>

Solid work, Kurai, and we'll send you a Logitech mouse for your troubles - assuming you deign to use such backwards interface tools these days!

But she wasn't alone with the great postage this month. Our runners up:

Tantryl's tale of cheap and OEM PSUs:  
<http://www.atomicmpc.com.au/forums.asp?s=2&c=9&t=16615>

A tale of romance and truly inspiring musicianship from Foods:  
<http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=113976>

Gramyre looked back at a special day eighteen years ago:  
<http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=114027>

Global Warming got the Director treatment:  
<http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=114261>

It's a wide open road, and The Tick travelled it in style:  
<http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=114739>

Amiga4eva got all old school RPG on the forums:  
<http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=115106>

Every Post of the Month wins a fabulous Logitech mouse  
Logitech, from the brilliant people from Logitech... Huzzah!!!!





## Carnage for currency

When the satisfaction of victory just isn't enough

Getting paid to play games is a geek's wet dream. Some get close to that goal by pushing their way into QA roles with developers or writing game reviews – but to just sit at home basking in the glow of your monitor and rake in cash for gaming is pure nirvana. While online poker and blackjack takes care of the armchair card shark, those with a penchant for first person combat can now turn fragging into fiscal reward with looming titles like *Kwari*.

An arena FPS that has recently entered the beta stage, the premise of *Kwari* is simple; players subscribe and deposit real money into an account, which is then credited or debited with each win or loss they suffer against another player. In fact, every time you hit another player you make money, while conversely damaging yourself, picking up additional weapons or even making use of map features debits your account. The service provider makes

its tidy profit by charging for the ammunition used in-game. You enter into a faceless arena without the ability to chat or display a handle, the engine even randomises the avatars of opponents after they leave your view. In a world where – apart from sponsored tournaments – games like Unreal Tournament or Counter Strike have rewarded the player purely through prestige and satisfaction, the cash-for-kills driver of *Kwari* sets an interesting precedent. If you thought wall and speed hacks were frustrating in an FPS when playing for fun,

imagine the towering rage you'll build up if those same exploits are used by opponents and cost you a cool hundred bucks in the process. Suddenly online anti-cheat systems become insanely important, needing to provide a 'NORAD' level of security and impenetrability. Punkbuster may not cut it when you're dealing with real money, but Intel's long awaited *Fair Online Gaming* (Anti-Cheat) hardware – fused directly to a PC motherboard – could be the answer.

The concept of cash-for-kills heralds more than just tougher anti-cheating mechanisms however. When the line that separates fun from competitive sport – money – is crossed, does it detract or enhance the gaming experience? The adrenaline factor of a game where you're fighting for money certainly can't be denied. Sweaty palms and moments of tension could create incredible atmosphere for an online shooter; ask any tournament gamer who's entered a competition for cash or prizes. The cash flow for events like the World Series of Video Games however, is in one direction only – from the organizers to the players. The *Kwari* market is bidirectional, meaning players with addictive personalities, latent gambling problems or a severe lack of talent could find themselves empty of pocket after lengthy gaming sessions.

"The game isn't about being the best player" comments Eddie Gil, founder of Kwari limited. "It's about the pursuit of money, with combat elements along the way." Hey, at least he's honest. There's every chance *Kwari* won't garner the attention of your garden variety player, and will sink slowly into gaming obscurity, but it provides the proof-of-concept for an influx of cash reward games, each one potentially chipping away at the innocent fun factor that gaming represents.

“... it's about the pursuit of money, with combat elements along the way”

**SHORT CIRCUITS**



To the original 8-bit Mario, we say goodnight. It's with the plucking of Zelda heartstrings that nostalgic gamers say goodbye to official support for their aging Nintendo game systems. Nintendo is finally pulling the plug on service and support for the 20-something year old NES console, also revealing that it'll end support for the N64, SNES and Gameboy lines. If you've got a working NES, our advice is to cherish it regularly, or learn how to solder.

After an almost endless stream of rumor and conjecture, it's been confirmed that Bungie software (developers of the ridiculously popular Halo series) will end its partnership with Microsoft. While Microsoft will keep an equity share in Bungie, the hope is that the parting of ways will allow the Halo developer to turn its obvious talents to producing games for platforms other than Xbox



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# SCANNER

Game, industry and online news for the enthusiast

SCANNER

## Sony giveth, Sony taketh

### Putting some oomph back into PS3 sales

Does everyone remember when the PS3 was just an exciting whisper? Millions fawned over the coming of an all singing all dancing CELL technology marvel, but it landed with a less-than-almighty thud onto the consumer floor, lagging behind sales of competing next-gen consoles.

The recent debut of a 40GB PS3 model for the beautifully modest price of \$AU699 combined with a simultaneous price cut to the older 60GB model have driven PS3 sales hurtling into the upper atmosphere, coming to rest somewhere around the orbit of Mars. What does this mean without the hyperbole? In the UK alone sales of Sony's premiere console rose by a staggering

178 per cent in the wake of the price cut and new SKU, giving it the strongest sales week it's ever had if you don't include launch week.

Unfortunately the more lightweight 40GB model comes with a few omissions, not least of which is zero backwards compatibility with PS2 games. While this might seem like a cruel feature to cut, Sony UK boss Ray Maguire says that the money saved could be better spent elsewhere. "We're still better off using the money that we'd put into backwards compatibility for either investing in new games or using it to help support bringing the price down so that people can get into the franchise."

## Sims 2 SecuROM

### The ROM we love to hate

The union of another PC game with SecuROM anti-piracy technology has resulted in messy times for avid Sims 2 fans. Electronic Arts chose to ditch SafeDisk in favour of SecureROM for its latest Sims 2 expansion 'Bon Voyage', causing countless headaches, OS reinstalls and crashes for gamers eager to try out the latest Sims experience.

It has taken EA a staggering five weeks to respond with an official statement to the thousands of jaded customers filling up Sims 2 forums with scathing remarks. SecuROM has had a turbulent history of touching gamers in a deep and meaningful way that leaves them

maniacal and bloodthirsty, with the recent release of Take 2's Bioshock also marred by the kind of attention only root-kits and SecuROM can provide. Absolutely bursting with irony is the fact that gamers choosing to go the Warez route for Sims 2 experienced no such issues after downloading a DRM free cracked version, leaving only the honest customers out in the cold.

Proving that the wrong crowd gets hurt with SecuROM craziness the *protected* Sims expansion pack was cracked, hacked, tied with a ribbon and distributed amongst various torrent sites within 24 hours of its release.



## PIPELINE



### Pirates of the Burning Sea

January 22nd 2008

If there's anyone out there that says they don't dream of sailing the seven seas as a pirate, they're probably lying. With that in mind, Flying Lab Software is blending the 18th century New World with the expansive canvas of the MMORPG genre to churn out Pirates of the Burning Sea. The game features over 80 ports - controlled and contested by the players themselves - providing fertile soil for PVP mayhem as hand-to-hand and ship-to-ship combat ensues. Capture a port and you'll have access to its rich economic resources, which will further you and your wooden leg towards piratical greatness. If you don't fancy yourself as Jack Sparrow, you can take up arms as the English, French, or Spanish in your quest to live out International Talk Like a Pirate day, every day.

[Platform] PC

[Developer] Flying Lab Software

[Publisher] Platform Publishing

[Web] [www.burningsea.com](http://www.burningsea.com)

## SHORT CIRCUITS

Ubisoft has managed to create controversy among the gay community with its seemingly innocuous 'Junior Scrabble 2007' release, which features the word 'lesbo' as part of an anagram. It's not the first time Ubisoft has danced on the edge of acceptable language, with its Nintendo DS game Mind Quiz pulled from UK stores for including the term 'spastic'.

As China's Communist Party Congress convenes to approve leaders to serve under President Hu Jintao, authorities are cracking down even harder on web content produced by its millions of domestic users that is deemed politically threatening. The international media rights group 'Reporters Without Borders' is calling on China to loosen its grip on Internet news and views, fearing the total dissolution of online freedoms in the country.

There's been a plague of developer acquisitions in recent times, including Activision swallowing Bizarre and EA snagging Pandemic and Bioware. There's abundant optimism from Bioware co-founder Ray Muzyka, who commented that "It's going to allow us to fulfill our mission statement of making the best story-driven games in the world."

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# 20th October 2007

## The greatest day, probably ever.

It was a mighty fusion of everything great. A nucleus of games and tech, releasing fun to the power of thousands of atomicans. There's never been an event like it, and won't be again, until the next one. *Atomic Live* was, simply, awesome.

Up on the main stage all manner of spectacles were thrown out there, as well as countless Nvidia caps. Our serious presentations had experts from leading tech companies showing you the good stuff about the future of tech. Talking about the future, Bond University certainly did, delivering a top presentation about tech career options.

The fun stuff was win. Major win. Sony Buzz is always an Atomic Live favourite, and the big game show set looked great. The Cosplay was a marvel to behold, with Losty and Dr Karl demonstrating an astounding knowledge, and lack of, respectively, cultural phenomena. Props to all who entered!

Speedbuilding was probably the single most intense and exciting thing that happened, and three sets of quivering hands threw together a system in less time than it takes to recover from a BSOD.

Down the other end of Live, the World GameMaster Tournament delivered an event of international standards. Our stage compares Bajo and Junglist from the Good Game show called the games like the pro e-sportscasters they are, and gave us all a good laugh every time they worked their magic. A huge congrats to the final winners:

**Counter-Strike:** Source: Advantage

**Quake 4:** zeal0r





**Opposite:** The Coolermaster giveaways were popular. Who doesn't like free stuff?

**Left:** The crowd was huge even before the doors opened. That's Atomican commitment!

**Below:** The Main Stage regularly drew a large, excited crowd.

**Below:** The Empire's finest guard an important cargo.

**Below:** Not even this great shot can show the scale of the event. Best. Day. Ever.



All winning players went home with thousands in prize money and major booty from ASUS and Intel.

All manner of exhibitors put on a wondrous host of goodies to see and play with in the main hall. Atomic Live was truly a magic zoo, where instead of giraffes and bears we had tech and games.

Aussie Auran put on a LAN showing off its new killer game, Fury, days before it was released to the rest of the world. How's that for special! Ubisoft had an extremely cool mil-themed GRAW 2 stand,

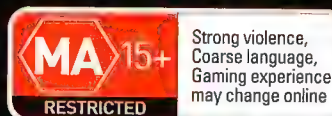
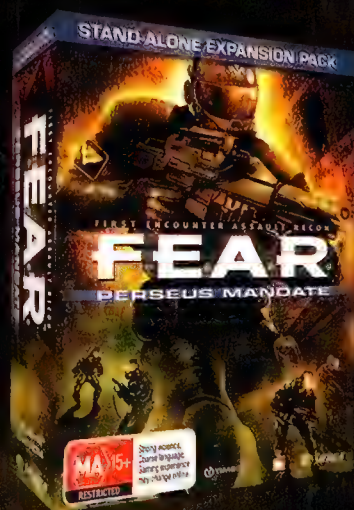


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# FEAR

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The World GamesMaster Tournament in action. Note the elite levels of concentration and camaraderie. Note also the very happy winners of the CS:S tournament – Advantage.



it was packed all day with intense spec forces combat. Aitech gave good game, too, with a couple of full on racing sim rigs, which everyone that had a go agreed were the bomb.

Chilled PC, long time purveyors to the super enthusiasts, stepped up with an amazing showing of water cooling gear that was just plain beautiful to see. Overclocking was seen in a whole new light with Josh and the crew from Team Australia dazzling us with extreme overclocking. The Dice and LN2 was in abundance, and stratospheric CPU frequencies were reached, like 5.6GHz from a stock 2.6 Core 2.

“The World GamesMaster Tournament gave us a gaming event of international standards”



All the awesome... awe of the speed building event. One day in the future, Atomic will be printed on magic electronic paper, just so we can show you how fast these guys were.





What's any convention-like gathering without a Cosplay Competition? This is just a selection of the Stormtroopers, aliens, anime characters and elf maidens that made Atomic LIVE such a colourful day.



**Above:** Our own Josh Collins, getting extreme.  
**Right:** Close up detail of the crazy dedication of Team Australia.  
**Righter:** Atomicans join the Atomic HQ for a few well-earned beverages.



Plus so much more. We'd like to thank all the companies that supported Atomic Live and put on such cool exhibits.

We hope everyone that came had a rockin time, in fact, we know you did. All day long the event was filled with thousands of happy smiling atomicans, the energy levels and vibe were golden and the whole thing was a day that we want to relive, and will – see you next year! ☺

# ATOMICCHAT

Talking to the finest human beings on earth...



## Nouredine Abboud

We have a chat with the PC Producer of Ubisoft's GRAW 2 about the impact of advanced physics processing in games, and just what GRAW 2 has to offer in the field of making explosions really, really pretty.

**atomic** What do you think is the main reason for the slow uptake and implementation of physics processing platforms from a game developer's perspective?

**Nouredine Abboud:** Physics imply a lot of scripting and testing whereas, even if they are very important for a game, they are not a 100 per cent must-have. But now that we've entered the Next-Gen era, gamers demand realism and impressive physics should be seen in most games.

**atomic** What are some of the technical challenges that Ubisoft faces when adding physics into a game? How much development time is devoted to physics?

**Nouredine Abboud:** The biggest challenge is scripting and testing. We have a whole part of the development and testing cycle dedicated to Physics and need to follow a specific organisation to make sure no cases that players could trigger have been left behind. Physics create so many different situations that it's difficult to keep their effect under control! Time is project dependant, but a good 10-20 per cent of the effort is devoted to this field when it's key.

**atomic** How will Intel's recent acquisition of Havok influence the physics engine development

landscape?

**Nouredine Abboud:** It's too early to comment; it will depend on what Intel does with the technology. However I think it's important to keep in mind that since Physics are now key for gamers, I don't see anything hindering the growth. Grin and Ubisoft have worked a lot for GRAW 2 with Intel and I'm keen on hearing from them on this.

**atomic** With so many physics processing alternatives being touted, from Ageia's PPU, CPU-based physics processing by AMD and Intel/Havok to GPU's from both NVIDIA and ATI, where does Ubisoft see the market heading?

**Nouredine Abboud:** We are open to working with quality partners. What is important for us is bringing the best experience to gamers, so what we are looking for are technologies that can be turned into gameplay propositions. What we really like is to first think about what we want to convey to the gamers, what is the game experience we think is cool, and then get to this goal with the best technology. One thing is for sure: there are a lot of talented folks out there so those alternatives are a good thing for the gamers.

**atomic** Since quad core CPUs are becoming more affordable and popular, does Ubisoft have any plans to implement multi-core

CPU based physics processing in its future games?

**Nouredine Abboud:** Yes. Graw 2 PC is already taking advantage of dual and quad core architectures. The best way to check this out is to play the game. There are a lot of great features that would not have been possible before the multi-core CPUs.

**atomic** Can you give us a couple of examples?

**Nouredine Abboud:** Multiple explosions (grenades, rockets... all the heavy stuff you find in a cinematic FPS) have a strong impact on the frame rate and are not usually compatible with the highest settings – but thanks to scaling, multicore provide a better warfare experience.

**atomic** How much of a performance difference can be seen between hardware and software-based physics processing?

**Nouredine Abboud:** When you go the hardware path, there are virtually no limits since you use a dedicated processor. For GRAW 2 PC, we've provided a specific level for Ageia hardware users and gamers were very happy with the results. Ageia Island is a fully-fledged mission included on the DVD.

**atomic** What kind of effects have you been able to implement on this special level?

**Nouredine Abboud:** Ageia card owners want to experience the next step in physics. They are usually dedicated fans. We bring them the ultimate level of realism. For instance in the Ageia level you have specific cloth and nature (trees, leaves...) movement and destruction effects.

**atomic** Can you tell us some of the upcoming PC titles that we can look forward to from Ubisoft that feature physics processing?

**Nouredine Abboud:** I'd definitely say Far Cry 2. They are really pushing the idea of destructible environments and have fully arbitrarily destructible vegetation. They are investing a lot of effort to offer the most realistic physics simulations in big exterior environments to ever ship on PC.

**atomic** Where do you see the future of physics processing development moving once it has become common place in games?

**Nouredine Abboud:** Physics are good for immersion but also for gameplay. The more we'll master physics ingame, the more we'll be able to focus their use on the gameplay to create realistic but also highly interactive situations. The people from Valve have done great things in this field, GRAW 2 PC is also showing some interesting gameplay related situations, but in this field the sky is the limit!

## Robin Walker

ALEX GAMBOTTO-BURKE has a chat to Valve's Robin Walker about Team Fortress 2, the mod community and long development cycles...

**atomic** You were one of the original Team Fortress designers, and were recruited from mod development by Valve. Do you think this can still happen? It seems as if making a mod isn't as simple a process as it used to be.

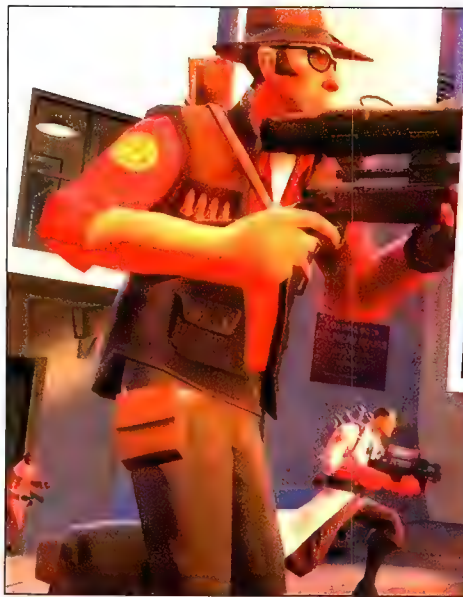
**Robin Walker:** Mod failure today seems to be an indirect result of over-ambition on the mod team's part, or more specifically, failing to adequately scope and constrain the mod's design based upon the resources the team has. It's hard enough making a game as it is, but when your team is inexperienced and spread out around the world, it becomes almost impossible. The only way you can succeed in that space is to understand exactly what you're trying to do, and what you're not. It's not surprising to see that most of the successful mods out there have very small team sizes, where each member is highly productive. The fewer members you have, the less structure you need and the easier it is to see what you can actually get done.

**atomic** Does the mod scene still hold as much relevance and importance at Valve as it did in the late nineties, when the company was probably its most vocal supporter?

**Walker:** Absolutely. At this point, mods have become utterly ingrained into our decision making process. Game technology-wise, every investment we make has a mod making discussion component to it, ensuring that whatever we build is useable and extendable by mod makers. Even our long-term technology strategy has been influenced by mods, in that things like Lost Coast were built so we could get our HDR technology out to mod makers long before our next product. On the product side, Steam's future is still aimed at solving problems for mod makers that we think are causing them grief. Distribution is still a pain for them. Transitioning to a commercial product is still much harder than it should be. Finally, we still keep finding extremely talented people to hire in the mod community. It's still the best breeding ground for finding highly motivated junior developers.

**atomic** To what extent was Half-Life 2 designed with 'modability' in mind?

**Walker:** Almost every level of the code architecture was influenced by modability. From our perspective, we wanted to give everything to mod makers that we could, and to hold back only the complex systems that we couldn't see any use in mod makers having. The only reason we kept anything back at all was because we were worried about scaring mod makers away with the amount



of code we would be handing them. Modability is really achieved by ensuring that you ask, "How will mod makers use this?" at every step of the way, and it was the mod work we did on Half-Life 1 that helped us get this into our process at a core level in Half-Life 2.

**atomic** You worked on the 'true' sequel to Team Fortress for over a decade. What was the biggest single contributing factor to Team Fortress 2's delays?

**Walker:** It can probably be summarised as inexperience. Our initial goals all led us down a path to a game that was incredibly complex, required a huge amount of learning on the part of players, and ultimately wasn't more fun at the end of it. It took us a few versions of trying out different approaches to realise we were fundamentally approaching things the wrong way. As a company, we were still figuring out our development process as well. After the rocky Half-Life 1 process, we felt like we really knew what we were doing, and that we wouldn't have the same problems again. We were sort of right: instead, we created a whole new bunch of problems to run into.

**atomic** What prompted Team Fortress 2's stylistic shift? Was it an attempt to distance the game from the many realistic, class-based multiplayer shooters that sprang up during TF2's development?

**Walker:** The version of Team Fortress 2 that



we showed in 1998 had a very realistic style. In the years that followed, we found ourselves constantly fighting this realism, finding all kinds of fun mechanics that were very hard to justify in a realistic setting, like the Medic's healing-beam weapon. Eventually, we decided to throw that realistic approach out, and focused on building the game instead. Later, when we understood what the game actually contained, we started to design a visual style that best fit the game we had. This allowed us to use the art style to solve a lot of game design problems, and to find one that fit the unique gameplay style. We were certainly cognizant of the many realistic shooters out there, and definitely wanted to stand apart from them, but it wasn't our primary focus.

**atomic** Were the 'vapourware' comments especially discouraging?

**Walker:** We always had something we thought was really neat, so the vapourware comments were more motivating than discouraging. We wanted to ship it as much as everyone else wanted to play it. Once we had our new art direction nailed, we couldn't wait to unveil it.

**atomic** How do you feel now that the game's released?

**Walker:** Great! The response has been more positive than we ever hoped. I'm already excited about the plans we have for the game over the next year. (P)

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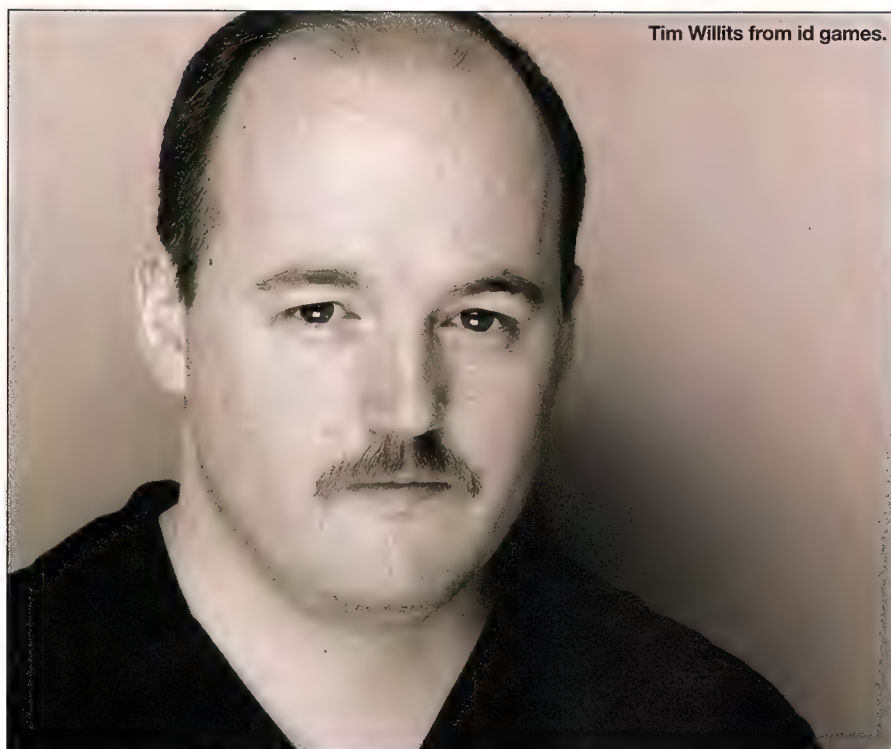


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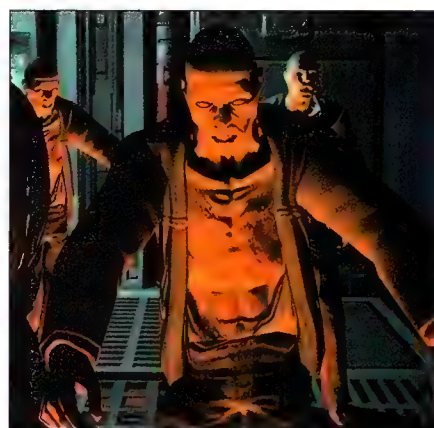
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# ATOMICX-RAY

Looking at tech from the inside



Tim Willits from id games.



X-RAY

exciting and enjoyable.

**atomic** Is it true that Rage is an open-world, sandbox-esque game?

**TW:** Yes. It's a story-directed open-world feel, where we have large outdoor areas that you can traverse on foot and in a vehicle. But you can also explore these classic 'levels', where you have that classic FPS action. So, what we've done, is we really wanted to make Rage stand out from our previous titles, like DOOM and Quake. And because it's a new IP, we really have the flexibility and luxury of blowing it out and delivering something people won't expect.

**Atomic:** Why move to this non-linear style of gameplay?

**TW:** Well, basically, I wanted to make a game that was fun and different. Fun is always my goal. We come to a crossroads in Rage, like with the driving stuff. We have realism, and then we have fun. And sometimes, something that's real isn't fun. So whenever we come to those crossroads, I will always pick the fun one. Even

## Inside iD

Alexander Gambotto-Burke sits down with Tim Willits of id to get an inside look at the company and its new franchise.

**atomic** It's been eleven years since your last new IP, and you've been very successfully working with your established franchises since. Why start afresh now?

**Tim Willits:** We've been lucky enough to have very successful franchises and find developers to work with us. We've got Raven, and Splash Damage, and stuff. And, so, we have these other teams who create good games for us; we have the luxury of exploring new ideas while the other IPs generate enough income. And if you don't come up with new ideas, you get stale. So, you always need to come up with new ideas, because that's what makes this exciting. That's what makes it fun, and that's what got us into it. So as to the question of "why now," well, why not all the time?

**atomic** Is it daunting assembling a new IP?

**TW:** Yes, absolutely. Very daunting. It's scary. Terrifying. You're absolutely right, because there are so many great games out there, and there are games that are hard to find, or hard for gamers to hear and see through the smoke and noise. And if you have a new IP, you have to not only make it great, but also battle aware-

ness of it. And as John [Carmack] said in his keynote, when you spend millions and millions of dollars on a game, you want to make sure it's successful. That's why you stick with successful IPs, because it's a helluva lot of money to bet. So, yes, it's daunting and it's scary, but it's also



▲ Doom 3 was certainly fun, but id is looking to create a new IP.

if it's a little out there, or a little arcade-y, if it's more fun, that's the route we take. And again, we like to make games that we want to play. And a lot of us like different game genres. We're all gamers here, so we wanted to have a game that embodied all the aspects we love.

**atomic** But your classic FPS fans won't be disappointed either, will they?

**TW:** No, we still preserve that action. We still want that in there, because, well, we invented the FPS. And we know how to do that. We know how to do the action, and the intense gameplay. But we wanted to take that and create a more unique, changing gameplay experience. So you can always find combat. You can drive around the wasteland, get out, find some bandits, and you can fight them. But then you can find these bunkers, or underground caves, and you don't need your vehicle there. That's where you'll experience our trademark FPS action.

**atomic** To what extent will driving occupy the player's time?

**TW:** Ah, yes, yes, yes. There's been a report that it's something like half and half, and you know, it's pretty early on to say what percentage, but it's a large percentage of the game. We want to make the driving combat really part of your avatar. It's just as much a part of you as your weapons and your inventory. I'm a big racing fan; I love playing racing games, but I just get bored with them too fast, so I wanted to add an element to *Rage* that was fun and arcade-y. But also, I want the game to be more expansive and open, so it allows me to go on a mission, or go find a mission. And you can get upgrades



The game that practically invented the genre.

for your car, and compete in races, and so on. That's the type of game I want to play.

**atomic** Would you describe the game as an RPG?

**TW:** I don't want to say RPG, because it's not really one. When you think RPGs, you think *Neverwinter Nights*. When you think adventure games, you think *Monkey Island*. There's no genre, really. Maybe I'll come up with a catchy genre name. *Rage* expands on things you won't find in other games.

**atomic** Finally, could you shed a little light

on id Tech 5, the engine that's powering *Rage*?

**TW:** id Tech 5 is the new engine John Carmack is developing; its main cornerstone is that you can uniquely texture the entire world, and all of the data can stream off the media, and give the player an environment in which they'll never see the same area twice. It's also the first truly cross-platform engine, with one asset base – and this is very important; never done before – we can run it on the 360, the PS3, the Mac, and the PC. So it makes cross-platform development significantly cheaper. And we've also revamped all our tools to make it more user-friendly for our future licensees.



▲ Expect *Rage* to feature more open areas to fight in and around, rather than *Doom*'s claustrophobic corridors and control centers. Zombies, though... wait and see.

“I’m a big racing fan; I love playing racing games, but I just get bored with them too fast.”

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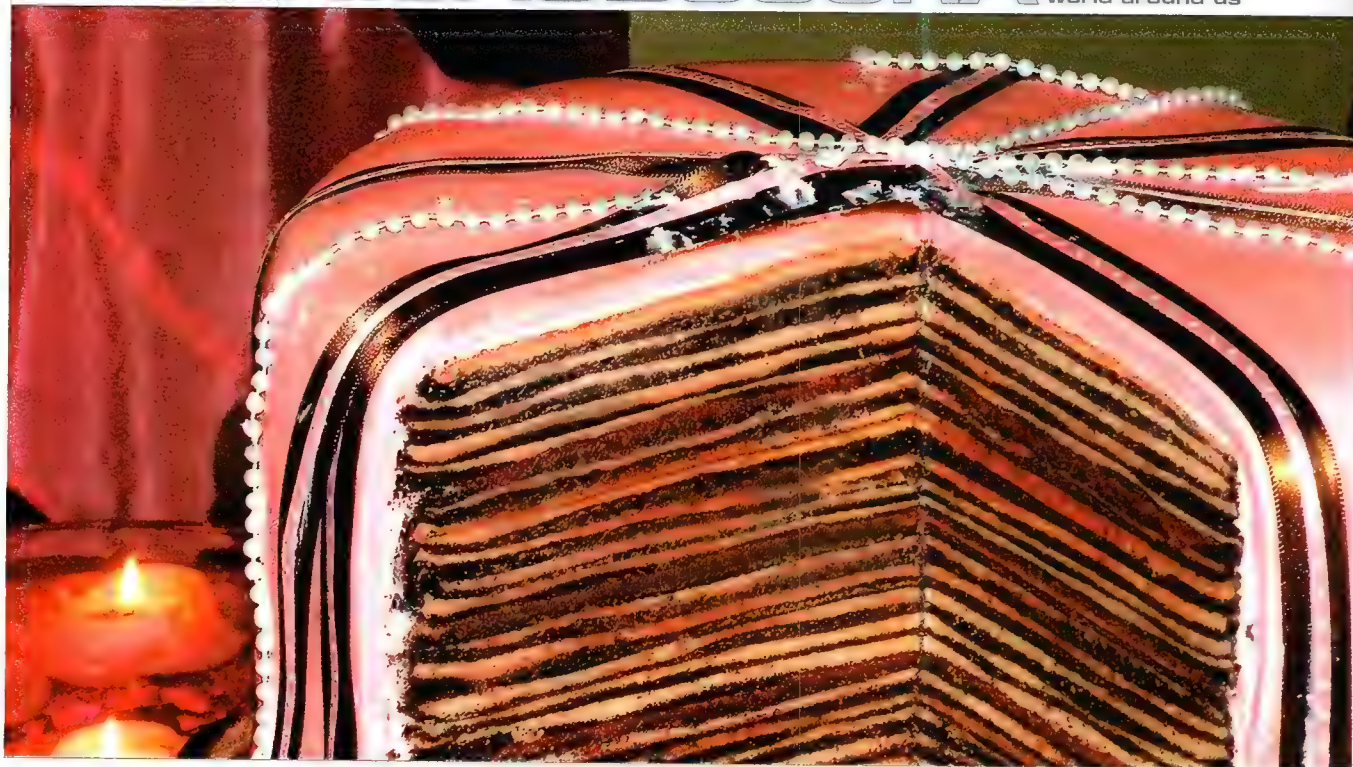
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# TECHNICA OBSCURA

The big picture behind technology and the world around us



## Portal power

Fall through a hole in the fabric of reality with **Ashton Mills**.

**W**ell, the guys from *Narbacular Drop* have come a long way. What started as a game development project became a minor internet phenomenon even before Valve took notice and put the team to work for its own nefarious ends. The result, of course, is *Portal* – which if you haven't played yet is akin to petting the Queen's behind, as one of our illustrious leaders once demonstrated. Or said another way: you need to play it. Now.

I wrote a short while back about the dearth of innovation in gaming today, showing how tiring the repetitive tirade of FPS clones has reached a saturation point that snazzy graphics can only prolong (witness: *Crysis* – yes, I'll shag it till the cows come home too, but it's still an FPS in very expensive sheep's clothing). Then, at the time, I said *Spore* was looking to be the most innovative and interesting game on the horizon for a while, and the initial response to it alone showed just how desperate the gaming market is for something *fresh*. A hearkening to when games broke new ground, instead of treading it into a muddy mess.

And now we have *Portal*.

Talk about coming from left-field. Sure, the trailers and promo videos showed us what to expect – and we all thought it was nifty – but this pales in comparison to playing it. I bought the Orange Box partly for *Episode 2*, and partly for *Portal*. But despite the swank sexy new joy of *Episode 2* sitting on my drive, it's been *Portal* I've been loading up again and again.

I can't state this strong enough: this game is *liquid joy*. And it is this alluring, suave, and seductive assault on the senses not because of uber graphics, scantily clad female characters, washed up actor cameos, or

some bitchin' sound track. It's just a puzzle game with a nifty concept. A simple, but *innovative*, concept.

It could just be me, but while playing it I found myself yearning for puzzle after puzzle – what will be in the next room, and what innovative solution will I have to come up with? That's the thing with *Portal* – it seems to make your brain think in ways it's just never done before. In all those years of puzzle

solving in newspapers, card games, Rubik's toys, and platform games (when is the next *Another World*, by the way?) and their ilk, none of them activate the sort of problem solving neurons you need for *Portal*. It's seriously freaky, almost like you can feel some dormant inter-dimensional problem solving centers waking up and having a party because zillions of years of evolution has finally found a purpose for them. Maybe this is what quantum physicists feel when they start playing with strings (hey, I can hope).

Throw in the fantastic attention to detail, a clever and small universe, and a clear love and polish – few games see these days and it is, in short, criminally addictive. For me, at least, I found solving a room in *Portal* far more satisfying than any shoot-em up contest with

the Combine. Hands down, *Portal* is more rewarding than *Half Life*.

Want to tell Ashton all about your special tricks with holes? He can't wait!

[amills@atomicmpc.com.au](mailto:amills@atomicmpc.com.au)



“ Maybe this is what physicists feel like when they start playing with strings. ”

## THE CONQUEROR



Like a fearless combating robot, Gundam packs with all the fire power to blow the competitors away. Newly patented Turbo Cooling System to keep the graphics card and HDD running smoothly, Shock-Free rails and Vibration-Free fan stabilizer to help protect the components inside while reduce the overall system noise. With a total of eleven drive bays and water cooling ready, Gundam will not be overmatched!



# The Great DDR2 vs.

**D**DR2 was, oddly enough, the successor to the original DDR memory standard. Now, four years after DDR2's initial launch, it's time for DDR2 to make way for its successor, the unsurprisingly named DDR3.

Some of the most notable features brought to the table by DDR3 include a deeper pre-fetch buffer from 4bit on DDR2 to 8bit on DDR3, lower power consumption with the use of 1.5v as the standard specification opposed to 1.8v on DDR2, and the ability to scale higher frequencies and bandwidth. This scaling occurs with the general rule of an incurred deficit of higher latencies – however, this is changing as the technology matures and speed binning occurs, as was seen with DDR2.

Additionally the move to DDR3 also offers the potential to utilise higher density ICs on the modules. This means there is the possibility that we will see 4GB, 8GB and 16GB kits while DDR2 has already hit a ceiling at 2GB modules (2 x 2GB kits). Any configurations around and above the 4GB mark, however, will require a 64bit operating system to truly take advantage of the entire memory address space.

Physically, there isn't too much to differentiate the two standards. They can both come in either single sided or double sided DIMMs, the modules are the same size and both standards sport 240-pin connection interfaces and use the BGA soldering technique to attach the memory IC to the module PCB.

As much as DDR2 and DDR3 may physically appear similar, the two standards are electronically incompatible. To assure that DDR3 modules are not accidentally placed in DDR2 memory DIMM slots, the modules use notches to physically alter and differentiate the standards. This notching, in conjunction with the electrical differences, renders no backwards compatibility between the standards.

In the coming months we will see the market drain the current DDR2 stock piles – particularly the Micron D9 based supplies – and the market will begin to shift

to the considerably more expensive DDR3 memory.

## Is the price justified?

As we saw with the change from DDR to DDR2 back in 2003, the swap over period exhibits an overlap where the older technology provides a higher level of overall performance. This is a difficult time for the industry as the consumer holds onto the previous generation of technology; this period is subsequently ended by the maturing of the new technology to a point where the higher price is indicative of the expected overall performance to be gained from the new standard.

Over the past few months we've seen DDR3 struggle to make inroads into the consumer market, especially the enthusiast computing spaces. This is due to the extremely strong performance still found in the previous technology. Not helping the situation is continual price drop of high-end, high quality memory such as the legendary Micron D9GCT, D9GMH and D9GKX. Many of the world's IC manufacturers, in particular Micron Technology, has a surplus of DDR2 based memory ICs, so they are keen to make the most of the old technology while they can.

So, memory kits get cheaper over all, at the same time as we see high performance ICs trickle down into the lower end kits. An example of this is Micron D9GMH being found in the Crucial Ballistix DDR2-800 CAS4 and DDR2-667 CAS3 kits – the majority of which happily run at DDR2-1000 4-4-4-12 with a little gentle persuasion.

Meanwhile, the majority of readily available and affordable DDR3 memory is Elpida and Qimonda IC-based memory.

Elpida and Qimoda ICs are not known for their overclocking capability and while the increased bandwidth with rather ordinary latencies does show a performance increase, it simply isn't enough to justify the difference in cost to the consumer. This was the scene for a number of months, up until Micron jumped into the DDR3 ring with a late but very fashionable entrance.

# DDR3 Comparison

Carrying the D9 moniker into the DDR3 realm and launching the attack with the D9GTR IC, Micron has hit extremely hard on the DDR3 ecosystem. Now with more competition within the DDR3 market and an IC truly worthy of the crown of 'Performance King', things are starting to look interesting.

## Cost to performance ratio

At this point in time, DDR2 is still holding the bang for your buck crown, and with a strong lead over DDR3.

In the performance stakes however, with the recent release of the Micron D9 family DDR3 IC and the strong scaling seen with additional voltage 'persuasion', the performance crown well and truly falls into the lap of DDR3, far out of the reach of DDR2.

DDR3 memory is advancing at an almost scary pace. Jumping from 666MHz (DDR3-1333) to 800MHz (DDR3-1600) and recently again to 933MHz (DDR3-1866) and with manufacturers such as Corsair already speed binning for their upcoming Dominator PC3-16000 DDR3-2000 CAS8 kit, we're going to be in for a wild ride.

We can only hold on tighter as Micron and its memory manufacturing partners prepare to release modules based on an even faster IC. This IC is named D9GTS... but wait, there's more! There are rumours around the high-level overclocking circles of a beast IC named D9GTT - if and when this IC will hit the market is sadly unclear at this point.

Even now, with a DDR3 IC capable of ludicrous amounts of bandwidth while still maintaining comparatively tight latencies, the allure of this incredible memory is still only in the reach of the most tech hungry enthusiasts, with a budget to match their passion.

## IC manufacturers - who's got the A-game?

There are a number of IC manufacturers in the world who engineer and produce memory ICs for us on DDR2 and DDR3 modules, and there's a smaller amount of manufacturers who hold a certain allure due to the performance of the products produced. As with car manufacturers, when it comes to memory IC manufacturing there is a distinction between the Ferrari Enzo and Hyundai Excel of the chip world.

The Ferrari Enzo in this instance is the Micron manufactured D9 IC family. These modules have proven to not only exceed the frequency and latency potential of other ICs but they scale tremendously, as we've said, with some fine tuning.

The ICs to look out for in the DDR2 world are:



atomic

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# EL DIABLO

The Devil's in The Details



**CS-EL Diablo BM**

Leading case makers know that paying attention to small things makes a big difference. Enter the EL Diablo from A+ Case. It is designed for those who already know what they want in their chassis.

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At this point in time, DDR2 is still holding the bang for your buck crown, and with a strong lead over DDR3.

	DDR2	DDR3
<b>Prefetch buffer</b>	4bit	8bit
<b>Stock voltage specification</b>	1.8v	1.5v
<b>Common enthusiast voltage</b>	2.1v to 2.45v	1.8v to 2.0v
<b>Pin density</b>	240-pin	240-pin
<b>Frequency of standard at launch</b>	200MHz (DDR2-400) and 266MHz (DDR2-533)	533MHz (DDR3-1066) and 666MHz (DDR3-1333)
<b>Current common high frequencies available</b>	533MHz (DDR2-1066) and 600MHz (DDR2-1200)	800MHz (DDR3-1600) and 933MHz (DDR3-1866)
<b>Common latencies at launch</b>	5-5-5-15 @ 266MHz	7-7-7-21 @ 533MHz
<b>Common latencies at current high performance frequencies</b>	4-4-4-12 @ 500MHz and 5-5-5-15 @ 600MHz	7-7-7-20 @ 800MHz and 8-8-8-20 @ 933MHz
<b>Possible maximum density on a single module</b>	2,024MB (2GB)	8,192MB (8GB) to 16,384MB (16GB)

- Micron D9GCT
- Micron D9GMH
- Micron D9GKX

And for the truly old school there are the discontinued early DDR2 legends:

- Micron D9DQT
- Micron D9DQW

These ICs were commonly referred to as 'Fat Body D9s', due to the physical size of the IC in comparison with other competing ICs on the market.

Other manufacturers in the DDR2 game include:

- Micron
- Elpida
- Powerchip
- ProMOS
- Qimonda (previously known as Infineon)
- Hynix
- Nanya
- Samsung

The DDR3 world is still young, though manufacturers are quickly maturing the fabrication process of their given products. A number of manufacturers made the jump to DDR3 fairly early whilst others are yet to release a DDR3 part. At this point in time, known DDR3 players include:

- Micron
- Elpida
- Qimonda
- Samsung

### Top of the Class: the Micron D9

If you haven't had the chance to use, and in particular, overclock, a set of Micron D9 based DDR2 or even DDR3 memory, you may be wondering why this series is so well regarded.

The D9 family is, quite simply, awesome.

Many ICs stick to standards such as DDR2-667 CAS4, DDR2-800 CAS5 and a small handful can push to DDR2-1000 CAS5 with minimal overclocking head room. This is where Micron D9 ICs are different. Not only do they have the potential to run tighter timings, i.e. DDR2-800 CAS4, DDR2-667 CAS3, but they also possess the potential to scale dramatically in terms of more efficient latencies and higher frequencies when additional voltages are given.

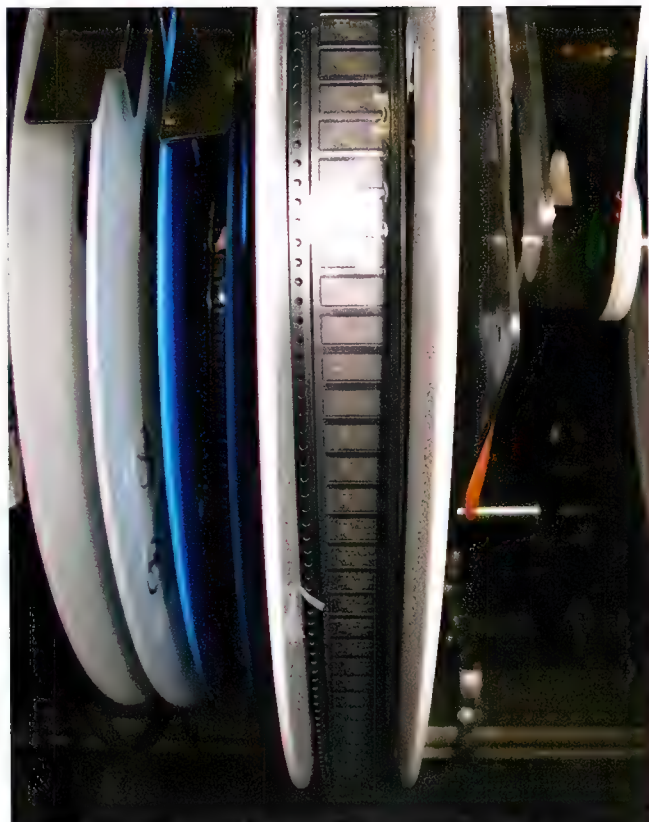
Effectively, this makes frequencies such as DDR2-800 CAS3 and DDR2-1200 CAS5 in stock kits available. Furthermore, enthusiasts, being the insane buggers we all are, found that additional voltages allowed for even further scaling. This means it's not uncommon to see Micron D9-based DDR2 memory running at DDR2-900 CAS3 and as high as DDR2-1200+ at CAS4. This does however depend upon the bin the ICs were taken from.

This allows for great bang for your buck from lower level kits sporting these ICs and known high potential and quality in the high level and more expensive kits.

The trend is continuing with the DDR3-based D9GTR and D9GTS. With additional voltage these modules are far exceeding the potential of any of the competitors.

The scary thing (and we love it) behind the DDR3 iteration of the D9 dynasty is that the IC's potential has scaled from 800MHz CAS8 (DDR3-1600) to a formidable 1000MHz CAS8 (DDR3-2000 CAS) stock part soon to be released from Corsair and a 933MHz CAS8 (DDR3-1866) part already available from the likes of Patriot. These are early days yet and no doubt we'll see considerable scaling continue to occur throughout the maturing of the DDR3 technology.

ABBREVIATION	TECHNICAL NAME
SDRAM	Synchronous Dynamic Random Access Memory
DDR	Double Data Rate
DIMM	Dual Inline Memory Module
FB-DIMM	Fully Buffered Dual Inline Memory Module
SO-DIMM	Small Outline Dual Inline Memory Module
CAS	Column Address Strobe (Select)
RAS	Row Address Strobe (Select)
ECC	Error Correcting Code
BGA	Ball Grid Array
PCB	Printed Circuit Board
IC	Integrated Circuit



A big reel of ICs at Corsair headquarters, that will soon, and at an incredible speed, be studded onto blank PCB. In other words, this is where the magic happens.

## IC BINNING

As much as the big man up stairs says all things are created equal, we can certainly say that memory ICs are not so lucky. IC speed binning allows for the ICs to be tested and stressed within given parameters and compared to others within the same batch or from batch to batch. From this process, the ICs with certain characteristics can be singled out and selected for a given application.

Some ICs perform strongly when it comes to low frequency with tight timings, where as some prefer looser latencies but excel at high frequency. There is a range of attributes tested for outside of these two, such as operational behaviour in high heat/low airflow situations or restricted/low voltage requirements. The cream of the crop, obviously, shines strongly in all the desirable attributes and are put aside for specialist kits – these are the ICs that make it into the very top of the line enthusiast performance memory and extremely mission critical server grade memory.

As with processors, speed binning plays hand in hand with supply and demand. This means that on occasion it's possible to have highly binned ICs fall into the lower models to meet demand. It is at these times that, as enthusiasts, we cry out to our overclocking lords and praise them for the kind offering they have made available to our humble gaming and benching past time.

## The future of memory

The future of memory is very evidently DDR3 at this stage. With it expected to be the standard up until some time between 2010 and 2012, we'll no doubt see some amazing kits of RAM hit the scene throughout the life cycle.

DDR3 memory got off to a rocky start, but after watching it mature and gather support, the pace of this standard's performance development is nothing but incredible to watch.

The days are young and the future full of potential. Not long now and we'll no doubt be seeing modules rated at DDR3-2500!

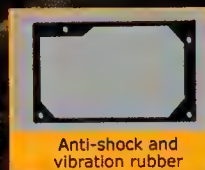
**atomic**

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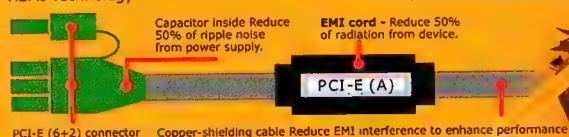
**Tagan U33 Power Supplies**



For those who build their own PCs, knows quality power supplies. NVIDIA and ATI certified with 6 or 8 pin PCI-E power cable options, the new Tagan 2 Force II Series are available from 400 watt to 900 watts and boasts 12v rail configuration often found in more top end PSUs. The Tagan 2 Force II series operates under the Tagan Silence Control Technology so you wouldn't even know it was there!

REMI Technology

Germany Patent: 202005005007



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## The Extra Big Xmas GearBox Special!



Ah, Christmas. It's coming, you know, and the geese are getting fat, if you like that sort of thing. There's also some old geezer who'd like a penny, but we say screw that, buy some of these nice toys instead!

### ◀ Rock USB Plasma Ball

**Price \$19.50 Website [www.anyware.com.au](http://www.anyware.com.au)**

All hail the arrival of the sub-\$20 plasma ball! We have truly entered an enlightened and privileged age of technology, that such things are available. In fact, we propose that the eons record this time as the '20 dollar plasma ball era'.

It's got guts, too. The plasma wivvering around inside is clearly quality stuff. Even in a bright room the energy is bold and bright. And all from a USB plug! Truly we fall to our knees in awe. It'll take a couple of AA batteries too, for plasma on the go. It does all the usual plasma ball tricks, being 1. It looks freakin sick, and 2. Touch it (or even \*almost\* touch it) and it wivvers and shimmers inside at the point of contact, caressing your finger with funky plasma lovin'.

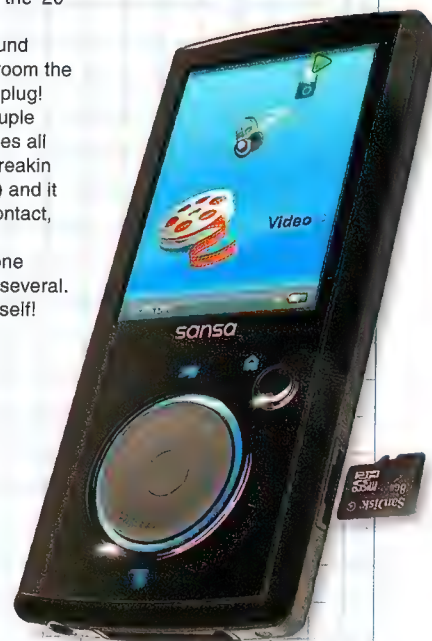
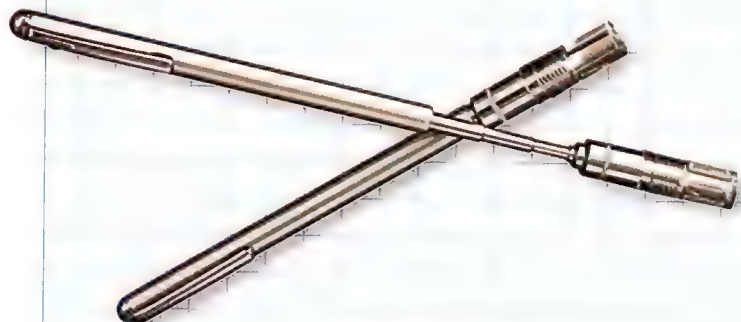
It's frankly impossible to comprehend anyone who *wouldn't* buy a 20 dollar plasma ball. Or several. Screw your friends, load up on these for yourself!

### The Rescue Stick ▼

**Price \$US4.99 Website [www.thinkgeek.com](http://www.thinkgeek.com)**

The floors of the *Atomic* labs are awash with parts, processors and other forgotten PC produce. But more ubiquitous than any other items are dropped and lost case screws – there are entire dune-like drifts of them that migrate like geese... but we can't get to them! Lost behind servers, stuck in gaps in the flooring, or huddling quietly in dark corners, they only ever seem to appear to at the wrong moment; like under our feet while lugging about the Frozen Cascade. What we've always wished for is a simple magnet on a stick, maybe with an LED light. Possibly telescoping, and with a twisty head.

Enter the Rescue Stick! Which, to be brief, is... a simple magnet on a stick, with an LED light. It telescopes, too, to get into hard to reach nooks, and features a twisty head to get at even the most difficult crannies.



### Sansa View ▲

**Price from \$299 Website [www.sandisk.com](http://www.sandisk.com)**

SanDisk's foray into MP3 players has been widely recognised as a clear success, and it's continuing the winning trend with the release of the shiny new Sansa View range. The View is about as fully featured as you can get – we're talking FM radio, a built in mic for all your voice recording needs and a micro SD slot to expand the View's storage. Speaking of which, it comes in 8GB and 16GB flavours, which is handy, because the View also boasts video playback via a 320 x 240 TFT screen. You can fit up to 24 two-hour films onto the 16GB model, more than enough room for entire seasons of your favourite TV shows, though the battery life will limit your long haul enjoyment – you'll only get about seven hours of video time, but that still beats Apple's Nano.

It's an attractive little unit too, which doesn't hurt, and is slim enough to fit into a pocket or similarly tiny space.



## ◀ Forbidden Lego

Price \$49.95 Website [www.woodslane.com.au](http://www.woodslane.com.au)

We know a lot of you are just like us. We like pushing memory frequencies, breaking out the dry ice and generally modding anything that isn't pinned down. So the idea of following instructions on how to put together Lego may not appeal, but folks, these are far from official instructions.

This book is written by two of Lego's actual designers, and it's clear from the get-go that they know their stuff. Each project not only clearly tells you how to build, say, a catapult that flings chocolates and other treats, but also exactly how each project breaks the official rules of Lego – no modding of the bricks, not non-lego parts, no projectiles and so on. These are some complex builds, rest assured, but even once you've built 'em all, there's an entire section on how to design your own creations, with hints and tips to make sure any project, no matter how ambitious, can be realised.



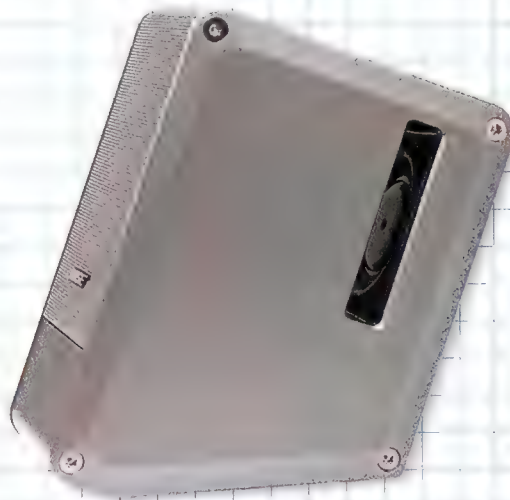
## Bose Computer ▶ MusicMonitor

Price \$499 Website [www.bose.com.au](http://www.bose.com.au)

This is what you want if you like supremely high quality PC speakers, but like them little and shiny. The sound is clear, powerful and particularly bright; a typical Bose characteristic. Classical music, strings and vocals sound magnificent through these. The bass is solid, and impressive for the size. This is thanks to the 'dual internal opposing passive radiators', an all-new proprietary Bose system. Little speakers can't fit a big reflex port (the vent in the back) to add body to the sound, so instead Bose has two small radiators, facing each other and vibrating in sync, and venting out the side slots. This comes close to achieving the equivalent of a full sized large speaker port. Very clever, Mr Bose.

Inside, the speakers are powered, and have tricky DSP algorithms to make things goldener. The speakers are high quality neodymium iron boron magnets, which deliver 10x the magnetic energy density of conventional magnets.

These puppies aren't cheap, as is the way of the Bose, but what you're getting is sound quality that beats larger speakers, in a very slick and sexy package.



## ▲ Plantronics .Audio 770

Price \$129 Website [www.plantronics.com](http://www.plantronics.com)

We like gaming; we like music; we like talking up a storm with our mates. And we really like these headphones, which let us do all three at the same time, and in style. The open ear headphones are designed to let you still hear anyone else gaming alongside you, and they deliver digitally enhanced virtual surround sound with a strong emphasis on bass. In other words, they pack a punch, whether you're listening to the sweet sounds of explosions and small arms fire, or chilling out with some soothing tunes.

The .Audio 770 features a noise-cancelling mic, so that even if your pals are arguing over that last head shot you inflicted upon them, your voice will still come over the line loud and clear – 'cause, you know, boasting is important. Connectivity is via a choice of 3.5mm analog or USB. And the headphones are light and comfy, too, and nicely padded – perfect for enduring marathon sessions without having your ear turn into some kind of squashed meaty lump.

## Kingmax 4GB ▲ microSDHC memory card

Price \$99 Website [www.kingmax.com](http://www.kingmax.com)

A picture is worth, so they say, a thousand words. A really good picture can also be worth a couple of megabytes of storage space. If we wanted to go further with the math, we're sure we'd come up with some seriously ludicrous number; suffice to say, the photographic story you could tell with this memory card is nothing short of EPIC.

The Kingmax 4GB microSDHC card is perfect for mobile phones, MP3 players and digital cameras. It's made using some serious manufacturing techniques that effectively halve the thickness of normal flash memory substrate, and can still get away with read speeds of up to 19.1MB per second. Perfect for HD and DVD video, as well as Super VCD, DVR and MPEG-4 HD.

# GEARBOX

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## 8GB DataTraveler, Secure Privacy Edition ▶

Price \$769 Website [www.kingston.com](http://www.kingston.com)

Some of these items make excellent gifts because they are cheap, yet cheerful. Others, because they are nice and gift sized, ready to be slipped into the smallest of stockings. Others still are great gifts because you just know they'll be an indispensable addition to whomever is lucky enough to receive it. The Kingston DataTraveler fits neatly into two of those categories...

Boasting a whopping 8GB of storage, this is the ideal tool for moving large files, or large numbers of small files, from site to site, or even room to room, given the amount of USB connectivity many entertainment appliances feature these days. On top of the sheer capacity of the drive, it's water-proof to four feet, and ruggedly titanium-coated. And if you really don't want just anyone having a sneaky look at the files you're transporting – like those 'special' films you like sharing with certain close Atomicans – the DataTraveler Secure Privacy Edition comes complete with 256-bit AES hardware-based encryption. Don't trust your digital stuff to anything less!



## ◀ Dell XPS M1730

Price \$variable Website [www.dell.com.au](http://www.dell.com.au)

For most people reading this magazine, the idea of buying a machine 'as is' that is also a 'gaming powerhouse' does not compute. That said, sometimes you just want a gaming solution that's more portable than powerful – and that's where the Dell XPS laptops come into their own.

It's packed with high end gear: a 2.4GHz Core 2 Duo, 2GB of 667MHz DDR2 SDRAM, two 160GB SATA drives and a Geforce 8700M GT graphics chip, running 2 x 256MB in SLI, as well as AGEIA PhysX technology. It's not going to burn through performance tests like your custom rigged desktop, but for something to game on the go, it's not a bad little performer.

## ▼ Belkin Clip-on Hub

Price \$24.95 Website [www.belkin.com.au](http://www.belkin.com.au)

Everybody likes convenience, and nothing says convenient like a USB hub. What with USB keyboards and mice, USB memory sticks, digital camera connections, and, of course, the absolutely necessity that is the USB Plasma Ball, even the most well-connected of PCs can run out of connectivity real fast.

This clip-on hub pretty much does what it says on the box, and adds another layer of convenience to your hard-bitten computing life. Stick it on the side of your desk, front or back, or even use it to bundle up a mess of cables – is there nothing it cannot do? It's powered, too, so won't add to the drain on your PC's power supply, and is specced for Hi Speed USB 2.0. Neato.



## Caplio R7 digital camera ▲

Price \$549 Website [www.ricoh.com.au](http://www.ricoh.com.au)

Some photographers insist on having the precision of an SLR at their disposal at all times, and are happy to spend hours fiddling away with obscure settings, while other photographers just want something they can keep in a handy pocket and take out at the pub to capture a few smiles. The new 8.15 megapixel Caplio R7 from Ricoh is perfect for those who like whipping things out at pubs.

It's one of the slimmest small cameras on the market, but it's still packed with useful features, for both taking great shots and making those shots even better after they're taken. Vibration correction ensures unsteady hands don't ruin the perfect pic, while a 7.1x optical wide zoom lens and face recognition feature mean you can always pick out the action. Once you've got the shot, onboard image editing features do the rest – brightness, colour tone and contrast can all be fixed in post, as the pros say.



## ◀ Sunbeam Beer Mate

Price \$569 Website [www.sunbeam.com.au](http://www.sunbeam.com.au)

I want you, dear reader, to sit back a moment, and consider... Is there anything more noble to give, is there any greater gift, than the gift of beer? No, think about it. Take a moment.

...

We're sure you've come up with the same answer we did. "No, *Atomic HQ*, there isn't." I'm glad we can agree on this important topic.

The Sunbeam Beer Mate is ready to be hooked up to any five litre commercial beer keg, and also comes with a six litre 'universal' keg if you want to drink anything else, like your own home brew. The beer mate can, apparently, work with soft drink as well, but really, who'd do that? A built in thermostat will chill your beer and keep it at the right temperature; this can also be set for different brews, so that you can enjoy beer as it's brewers intended.

Can your friends, afford not to have one?



## Logitech G9 Laser ▲ Mouse

Price \$169 Website [www.logitech.com.au](http://www.logitech.com.au)

Mice. Necessary computing evil, or highly customisable representation of one's own remarkable individuality? Well, d'uh, it's the latter of course; like a leather jacket to a hard-bitten biker, your mouse must be a sturdy tool and stylish to boot. Logitech's G9 Laser is up to the job.

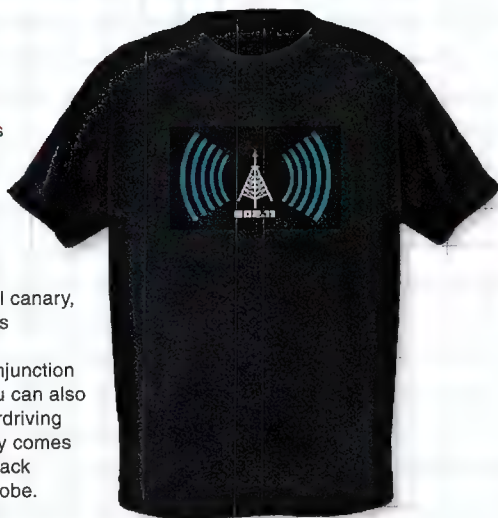
The G9 comes with swappable grips to make sure your hand is perfectly interfaced with the mouse, customisable weights to set the mouse to the right amount of heft, and custom LEDs – pimp my mouse indeed! Under the hood, the G9 boasts a 3200dpi laser, polytetrafluoroethylene (which is science speak for 'smooth') feet and a precision scroll wheel.

## Wi-Fi Detector shirt ▶

Price \$29.99 Website [www.thinkgeek.com](http://www.thinkgeek.com)

You've got to love this shirt. Forget mobile phones with built-in cameras and MP3 players as the ultimate convergence wet dream – this is the real deal. Not only does it keep you un-naked, or clothed, as some people say, but it's also an important tool for the modern computer user. At least one person in every group of friends should own one, so they can become some sort of digital canary, but, you know, with less dying, and more delicious wi-fi detection.

The shirt is battery operated, and pulses in conjunction with local 802.11b or 802.11g signal strength. You can also detach the plastic panel, so after a hard days wardriving you can wash the 100 per cent cotton shirt. It only comes in black, but we don't see that as a bad thing – black certainly features heavily in the Atomic HQ wardrobe.



Leadtek Nvidia GeForce 8800GTS ULTRA Water Cooled 768MB **From: \*\$1240**



Intel CPU E6850 Core 2 Duo 1333 FSB 3.0 GHz **From: \*\$385**



Leadtek Nvidia GeForce 8800GTS 640M **From: \*\$543**



Samsung 226BW 22" LCD 5MS 3000:1 C/R **From: \*\$525**



Logitech G15 REV 2 Gaming Keyboard **From: \*\$105**



Corsair TwinX 6400C4 2GB Kit 800 MHz 4-4-4-12 Timings **From: \*\$159**



Samsung 500GB SATA II 16MB Cache 7200 RPM **From: \*\$149**



Asus P5N32-SLI s(775) Motherboard **From: \*\$325**



[www.arc.com.au](http://www.arc.com.au)

### Asus G2S Notebook

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2GB Memory Supports 4GB DDR2 667  
300GB SATA HD  
DVD Burner  
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Webcamera  
nVidia GeForce Go8600M GT 256MB  
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Half Life 2 Source

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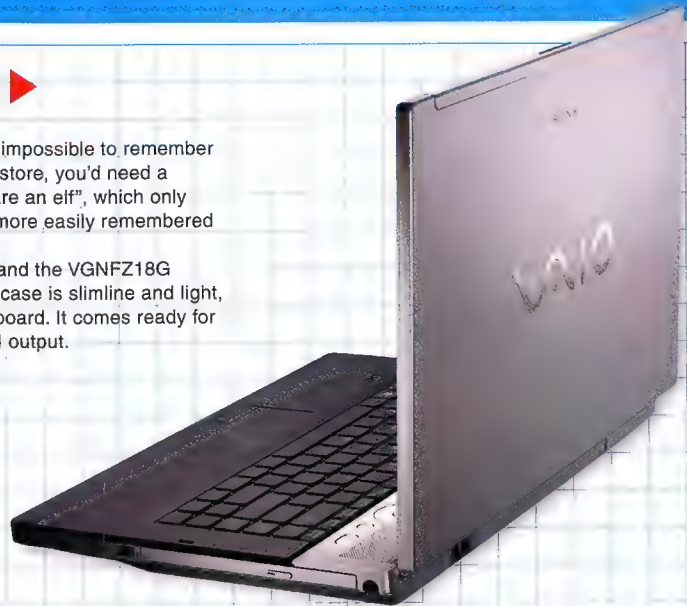
[www.3DGame.com.au](http://www.3DGame.com.au)

## Sony Vaio Premium VGNFZ18G ▶

Price \$3,399 Website [www.sony.com.au](http://www.sony.com.au)

Okay, first, a quick rant. Just what is it with counter-intuitive and impossible to remember product codes? If you were going to purchase one of these in a store, you'd need a crib sheet, or the code written on your hand (a la "Murphy, you are an elf", which only Simpsons fans will get); you'd forget it, otherwise. We demand more easily remembered product names and codes!

Ahem. Sony excels at making easy to use, elegant products, and the VGNFZ18G ("shudder") is no exception. The matte black and brushed silver case is slimline and light, and there's a host of neat controls set into and around the keyboard. It comes ready for serious entertainment duties, too, with a Blu-ray drive and HDMI output.



## ◀ Toshiba Gigabeat U series

Price \$189 Website [www.toshiba.com.au](http://www.toshiba.com.au)

Sometimes it's nice to get away from the super-duper products packed with bells and whistles; sometimes you just want simplicity, one product that does one thing well. That pretty much sums up Toshiba's Gigabeat U series of MP3 players. With 2GB of storage, there are certainly bigger players on the market, and sure there are more fully featured ones. But the U series offers crisp playback, easy to navigate menus, and 20 hours of battery life all in one neat little white (or blue) case. You also don't need to install any proprietary software to get music onto the Gigabeat U; you can even plug it into your CD player to rip music as it plays back in your lounge.

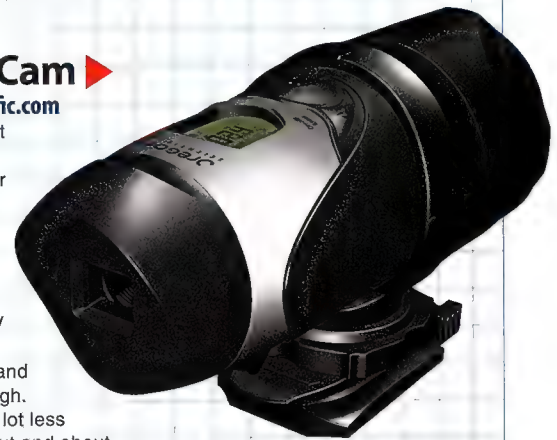
Voice recording's on the menu as well, as well as recording from the built-in FM radio, which also lets you transmit to a car radio or home stereo.

## Oregon Scientific Action Cam ▶

Price \$199 Website <http://www2.oregonscientific.com>

For 200 bucks this video camera has a heck of a lot going for it. Designed for action sports, it's rugged, waterproof (to 10 feet) and will record up to an hour of footage at 640 x 480, 30fps on a not-included 2GB SD card. Lower res and frame rates are selectable for extended recording times. It comes with straps to attach it to your helmet/whatever and dumps to an .avi that's read off the cam as a USB device. Very sweet. On the downside, the FOV is very narrow, on the fly editing and deleting is a chore and the recessed lens makes cleaning mud and muck difficult. Image quality is poor, but good enough.

What we like most is that at 200 dollars you're a lot less precious about it than a \$2,000 cam when you're out and about being adventurous, which adds up to reckless risk taking fun.



## ◀ Samsung U700

Price \$749 Supplier Samsung Website [www.samsung.com.au](http://www.samsung.com.au)

Sometimes, convergence is pretty damned sexy, and here's a HSDPA phone that has sexiness in spades. The Samsung U700 is made of shiny; not just in the *Firefly* sense of the word, but real actual shiny. It has a finish that is mirrored while the display is inactive, which means you will never want for an emergency spy mirror to see what's around the corner or under that door. Probably doesn't hurt when applying the odd spot of eyeliner, either. Looks aside, the U700 is feature-packed: flash memory-powered 3.2MP camera, one-touch Google access, and ICEpower audio from Bang & Olufsen matched with Bluetooth functionality for lovely wireless music playback.

All of this is elegantly packaged in a slimline case a mere 12mm thick, and that weighs in at a sparse 85 grams.

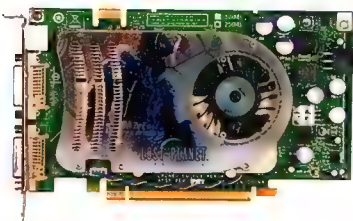
And did we mention it was shiny? We like the shiny.



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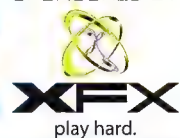
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MEL C03 9558 6030  
BRS C07 3017 2000  
PER C26 9242 6622

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VIC MegaPC	03 9793 9676	<a href="http://www.megapc.com.au">www.megapc.com.au</a>	Scorpion Technology	1300 726 770	<a href="http://www.scorpnet.com.au">www.scorpnet.com.au</a>
QLD Game Dude Pty Ltd	07 3387 1500	<a href="http://www.gamedude.com.au">www.gamedude.com.au</a>			
SA Getright International	08 8362 0622	<a href="http://www.getright.com.au">www.getright.com.au</a>	Alneeds Computers	08 8211 8661	<a href="http://www.alneeds.com.au">www.alneeds.com.au</a>
TAS Office Equipment Warehouse P/L	03 6272 6272	<a href="http://www.oewcomputer.com">www.oewcomputer.com</a>	Tas. Principal Computers	03 6234 5677	<a href="http://www.tasmanianpc.com.au">www.tasmanianpc.com.au</a>

TOMORROW'S TECHNOLOGIES — TODAY

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# HARDCORE



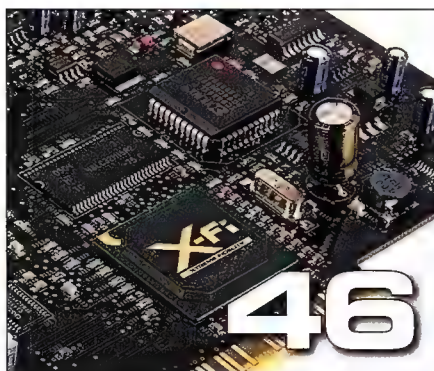
NEWS, REVIEWS AND ROUNDUPS ON THE LATEST HARDWARE

This is a super hardcore HardCore this issue, thanks to the very serious, very in depth look that Jake Carrol has at some great soundcards. Not only has he benched the living daylights of them, but he also explains what you should be looking for in a card. Lovely.

Of course, we've got the best reviews, too, from a special sneak peak at

the incredible power and value if the 8800 GT that Josh brought back from the states, to the sleek and roomy Coolermaster case a few nice things in between.

We round things up with the usual suspects, wherein Josh lets us in on an industry trend, and Dan starts thinking about conservation of a species.



## HARDCORE CONTENTS

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Detailing the regulars of the labs.

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Jake Carroll takes a close up look at seven very different soundcards.

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The reason you're considering a third job.

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**The Chipperry** 62  
There's a change coming on the wind, and Josh Collins knows what it is.

**Ground Zero** 64  
Dan Rutter gets all worked up over an endangered species close to our heart.



## LeadTek Prize pack!

[www.atomicmpc.com.au/competitions](http://www.atomicmpc.com.au/competitions)

LeadTek is being incredibly generous with us this month, and they've offered us one huge swag of toys to give away to our oh-so-wise readers.

**FIRST PRIZE:** 1 x PX8800GT 256MB and 1 x DTV Dongle TV card

**SECOND PRIZE:** 1 x PX8600GT HDMI and 1 x iCam 200 webcam

**THIRD PRIZE:** 1 x CarePhone IP phone

There's only one way to win this kit, and that's to point your browser at the above URL and flex your thinking muscles.

## BENCHMARK

How we test,  
what we test,  
when we test it

**3** DMark05 and 06 are the legs of our bench. As freely downloadable tools, they allow people all around the world to compete on a single platform, regardless of its indication of real world application, and its ability to keep our table stable.

On the gaming surface, Call of Duty 2 takes first honours in the FPS department. Quake 4 follows closely behind for our OpenGL benchmarks, taking over from where the venerable Doom 3 left off and offering multiple CPU optimisations. Half-Life 2 remains, its market penetration simply too huge to ignore. X3: Reunion makes an appearance, in an effort to have a benchmark that is not an FPS. In the same line, Splinter Cell: Chaos Theory has also been added. Other games do exist. Honest.

All tests are run at 1280 x 1024, 1600 x 1200 and 1920 x 1200 with vsync off, to cater for the most popular LCD resolution, CRT resolution and those who own widescreen monsters respectively.

To hit the CPU, we use LAME MT, a multithreaded version of the



The Atomic Hot Award is given only to the best. In our roundups, we differentiate the best further using the following awards:

**VALUE AWARD** This means the product is the best buy price-wise.

**PERFORMANCE AWARD** Price isn't a big factor – it just has to make our benchmarks burn and our eyes water.

**EXTREME AWARD** Forget everything. If it's mind-blowingly amazing, then it'll get an Extreme Award.

popular MP3 encoder, which is used to compress a standard 30-minute WAV file. Similarly, VirtualDubMod is used to compress a standard 1GB raw video file into XviD at 1300Kb/s. Other CPU specific tests in our stable are Maxon's CineBench and SuperPi Mod. Rounding out the suite, SiSoftware's Sandra tests several subsystems across the board, while HDTach and ATTO Disk Benchmark helpfully provide hard drive scores.

All these tests are run on a Windows XP SP2 platform, running the latest official drivers available. Every test is run three times to eliminate any oddities that may crop up along the way, the final result printed in the magazine being an average of those scores.

Of course, all this is pointless without a standard set of hardware, and as such it is laid out below for the world to see. On with the testing!

## BENCHMARKS

## Graphics

## 3DMark05

Game tests only, 4xAA, 8xAF  
[www.futuremark.com](http://www.futuremark.com)

## 3DMark06

Game tests only, 4xAA, 8xAF (SM2.0), 8xAF (HDR/SM3.0)  
[www.futuremark.com](http://www.futuremark.com)

## Half-Life 2

Canals custom timedemo, 4xAA, 8xAF, all details highest, HDR off  
[www.half-life2.com](http://www.half-life2.com)

## Splinter Cell: Chaos Theory

Lighthouse Demo, Shader Model 3.0, 8xAF, shadow resolution high, all features on  
[www.splintercell3.com](http://www.splintercell3.com)

## X3 Rolling Demo

High settings, auto quality control disabled, glow enabled, 4xAA, 8xAF  
[www.egosoft.com/games/x3/info\\_en.php](http://www.egosoft.com/games/x3/info_en.php)

## Call of Duty 2

Hill 40 – Defend custom timedemo, 4xAA, 8xAF, all options highest  
[www.callofduty2.com](http://www.callofduty2.com)

## Quake 4

High quality, 4xAA, 8xAF, Multiple CPU support, all options highest  
[www.quake4game.com](http://www.quake4game.com)

## Subsystems

## HDTach

[www.simplissoftware.com](http://www.simplissoftware.com)

## LAME MT

[softlab.technion.ac.il/project/LAME/html/lame.html](http://softlab.technion.ac.il/project/LAME/html/lame.html)

## VirtualDubMod

[virtualdubmod.sf.net](http://virtualdubmod.sf.net)

## SuperPi Mod

[www.xtremesystems.com/pi](http://www.xtremesystems.com/pi)

## Cinebench

[www.cinebench.com](http://www.cinebench.com)

## SiSoft Sandra

[www.sissoftware.co.uk](http://www.sissoftware.co.uk)

## Everest

[www.lavalys.com](http://www.lavalys.com)

## Others

## DisplayMate

[www.displaymate.com](http://www.displaymate.com)

ATI Tool [www.techpowerup.com/atitool](http://www.techpowerup.com/atitool)

## RivaTuner

[www.guru3d.com/rivatuner](http://www.guru3d.com/rivatuner)

## FRAPS

[www.fraps.com](http://www.fraps.com)

CPU-Z [www.cpuid.com](http://www.cpuid.com)

Stress Prime 2004 Orthos  
[sp2004.fre3.com](http://sp2004.fre3.com)

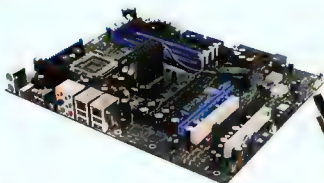
## ATOMICBENCH Our standard hardware that gets regular labs lovin'.

intel



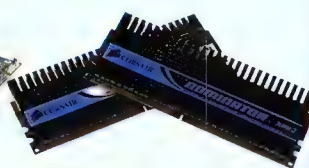
▲ Intel Core 2 Duo X6800

EVGA



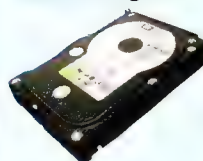
▲ EVGA 680i SLI

CORSAIR



▲ 2GB Corsair Dominator PC2-10000

WD Western Digital



▲ WD 1500ADFD

ENERMAX



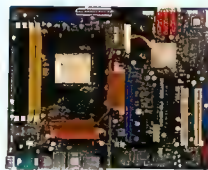
▲ Enermax Galaxy 1000W

AMD



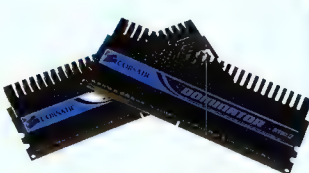
▲ AMD Athlon 64 FX-62

ASUS



▲ ASUS M2N32-SLI Deluxe

CORSAIR



▲ 2GB Corsair Dominator PC2-10000

DELL



▲ Dell 2405FPW

ASUS



▲ ASUS 8800 GTX

# ASUS P5E3 DELUXE/WiFi-AP@n

## 58.6% CPU Power Savings



When I took a look at the new ASUS P5E3 DELUXE/WiFi-AP@n motherboard, the thought that stuck to my mind was the extreme performance and revolutionary energy saving mechanism.

### Native FSB 1600 and DDR3 1800 Support

Based on Intel's flagship X38 chipset, this motherboard comes incorporated with dual PCI Express 2.0 x16 slots for enhanced system performance and overclocking capabilities. It even natively supports FSB1600 – making it ready for the next generation Intel CPU. Wow! Also, support for DDR3 1800/1600 makes this motherboard work perfectly with hyper DIMMs, and I only needed to select the memory frequency in BIOS, and the system would automatically optimize all the relevant parameters like CPU frequency, ratio and memory settings. Being so convenient and uncomplicated, this motherboard is just what all PC enthusiasts would want!

### ASUS Exclusive EPU Saves 58.6% CPU Power

The ASUS EPU (Energy Processing Unit) is a unique IC controller that is the first hardware-based on-demand power saving solution in the PC industry and transcends past PC technologies from manual to automatic power adjustments. When I was playing heavy-loading 3D games, the EPU provided the CPU with stable and sufficient power; and when I switched to Internet browsing or office packaged software, it detected the loading change instantly and automatically activated power saving mode to save up to 58.6% CPU power. This outstanding design helps to save both energy and the environment.

### 7% Increased Power Efficiency with 3rd Generation 8-phase Power Design

In regards to motherboard power performance, the key factor that matters is "power efficiency" rather than the

nominal "phase of power". I was pleasantly surprised to learn that this motherboard provides an increase of 7% in terms of power efficiency – far better than other motherboards available today. Looking at the board design, the P5E3 DELUXE/WiFi-AP@n is equipped with the industry leading ASUS 3rd generation 8-phase VRM design, and provides longer component life and lower power loss with high quality power components. These include: low RDS (on) MOSFETs for minimum switching loss & lower temperature, Ferrite core chokes with lower hysteresis loss, and high quality Japanese-made conductive polymer capacitors. All these add up to give you lower ripple voltages for more stable and reliable power that prolongs CPU lifespans!

### Access the Internet in 5 Secs with Express Gate

With only 5 seconds boot-up time, the ASUS Express Gate offers an optional boot-up selection that allows you to instantly surf the Internet without entering Windows. I'm so glad that I can now enjoy Skype, IM, YouTube, and webmail whenever and wherever I want!

### Onboard WiFi-AP @n

With the cutting-edge IEEE 802.11n draft technology onboard support, I

could enjoy wider network coverage and data transmissions of up to 6 times faster than the previous 802.11b/g standards. The two-antenna design encompasses wider network coverage, as well as providing superior signals than previous standards even after wall penetration – allowing me to get online everywhere at home without any blind spots!



\* when Intel C1E is disabled. \* Shorter is better.  
\* Please visit [www.asus.com](http://www.asus.com) for the test configuration.

# THE INVASION

## SAVE



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# UNIVERSE AT WAR

**EARTH ASSAULT**



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**COMING DECEMBER!**



# ATOMIC AUDIO 101

Jake Carrol takes us on an aural odyssey, and discovers the importance of good sound, and a good sound card.

Our senses are dazzled by technology on a regular basis. The capabilities of the humble computing equipment in our homes can now provide us with a 'theatre-like' experience, in both the interactive and non-interactive sense. At some recent point in time, however, visual magnificence took over from audio wizardry and the importance of sound in a multimedia experience was relegated to second fiddle. This is evident in the onus that enthusiasts place upon their GPU's over their SPU's. This month, we take apart PC audio in a way that only Atomic can in order to discover the truth behind the claims laid down by the onboard sound vendors, Creative, ASUS, Auzentech and others.

## Controlling the uncontrollable

One of the things that makes sound card evaluation so difficult (or the appraisal of any audio device for that matter) is that the process is so subjective. What one person can hear, another may not. What one person thinks sounds 'good' another may not appreciate, or, in more extreme cases, will think sounds 'bad'. When we figure in the acoustic variables of speaker selection, sample/audio data selection and the physical room a system is tested in, we have a raft of factors that will never result in the same answer across the board for all end users.

We need a way to quantify results in order to augment and compliment the 'What you Hear' style tests.

Fortunately for us, there are some brilliant folks out there who have come up against the same problems. RightMark has been a trusted name in wavetable analysis for some time now offering up the audio hardware analysis tool RightMark Audio Analyser (RMAA). Before we delve into analysis however, we need to understand the market, the products and the metrics used to test them.

## The Market

The target market of all the cards on the bench this month is clearly the gamer/enthusiast. It also borders on the home-musician and entry level digital music solution market but stops just shy of it. As a result, we shouldn't draw comparisons between this hardware and products from the likes of DigiDesign, MOTU or M-Audio manufacture.

## TECHNICAL GUFF

## The cards

This month, we had seven different devices on the test bench.

- **Asus Xonar D2**
- **Auzentech X Meridian 7.1**
- **Creative Audigy 4**
- **Creative X-Fi Xtreme Gamer**
- **Creative X-Fi Xtreme Audio Notebook**
- **Creative X-Fi Elite Pro**
- **Onboard HD 8 channel Karajan Audio [Realtek ALC-882 chipset]**

NOTE: We endeavoured to get hold of the Auzentech Prelude, but were unable to secure the hardware in time for this feature.

## The system

The system, and the room to house these cards for testing, was as follows:

- DFI NF4 Ultra-D SLI motherboard
- AMD64 x2 x4600+ processor
- 2GB DDR PC-3200 Corsair RAIM
- Pioneer BDR-202 BluRay writer/reader
- Antec P182 case
- 2 x HDS Enterprise 250GB HDD's (storage)
- 1 x Seagate 120GB HDD (boot)
- 1 x Geforce FX 7800GTX PCI-E GPU
- 2 x Dell 2407-HC rev01 HDCP compliant LCD panels
- 1 x Antec TruPower 480W PSU
- Altec Lansing U621 wooden ported, tuned 2.1 channel speakers
- Room dimensions, 320cm x 250 cm carpeted floor, free of obstructions apart from computers and display panels
- Windows Vista x64 Ultimate Edition

## The samples

The samples we used for analysis included the following:

- Pink Floyd's Dark Side of the Moon DVD-A (96KHz Audio)
- Tool's 10 000 Days (44.1KHz, 16bit Audio)
- Multiple FLAC sources (48.8KHz, 24bit Audio)
- Denon generated test tones CD (44.1KHz, 16bit Audio)
- 192KHz 32bit test tones generation, Sony's Sound Forge 9.0c
- Positional audio samples from RightMark

## The Metrics

Metrics used in testing:

- CPU load while decoding formats (FLAC, BluRay Audio, MP3, WAV, WMA, Ogg)
- Frequency Response
- Noise level (dB) A
- Total Harmonic Distortion (THD) rating for a given sample
- Intermodulation distortion percentage
- Stereo Cross-talk
- 3D Positional accuracy

## TESTING PROCEDURES

For all devices tested, we played a series of samples through the playback device and measured CPU utilisation. We did this for FLAC, BluRay Audio, MP3, WAV, WMA and Ogg formats. We then used Right Mark's Audio Analyser to test the hardware frequency response at 16bit, 24bit and 32bit if the hardware supported it. The next step was using RMAA to test noise levels on output of 16, 24 and 32bit samples and then testing THD, intermodulation distortion and stereo crosstalk using RMAA's advanced functions.

RightMark uses a technique called External Loopback, to take the signal of the raw output of the soundcard and push it into the raw input, thus allowing us to test not only the abilities of the hardware to output effectively but also the ability to recapture and understand the input. The test is achieved by sending a single 3.5mm stereo cable from output of the card back to the line in. RightMark requests a very specific, gold plated, 3.5mm diameter, 15cm long cable for this task in order to give us a standard basis for comparison.

Finally, we tested the 3D positional accuracy of the decoders using RM's 3D Audio analysis suite and staged a listening test, to try and gauge how good a device 'sounds' through a known monitoring source.

## CPU utilisation tests

Here we tested each audio device in turn using different samples to examine each card's hardware decoding functionality. Increased CPU utilisation suggests lesser ability of a given audio device to offload decoding into hardware efficiently. Please refer to Table 1.

The results have proven a few things about the hardware decoding capabilities that the manufacturers constantly emphasise. Looking at the low utilisation of the onboard Karajan solution makes us wonder just how much importance needs to be placed on the hardware decoding capabilities of the dedicated PCI solutions. That said, the device with the highest output attenuation and subjective audio quality (the Auzentech Meridian) has the highest average CPU usage across all codec's tested. The Xonar D2 surprised us with relatively high CPU usage for both FLAC and OGG. We felt that the Auzentech's performance with OGG and FLAC bordered on the unacceptable, if you consider that 8.5 per cent of CPU time in an intense gaming environment could

potentially mean the difference of a few frames per second. We were awe struck by the results of the X-Fi notebook. CPU usage is practically zero. We feel the express bus has exerted some benefit on sound processor unit offloading here. If there is a 'winner' at all here, it is the more technologically advanced bus that the X-Fi notebook connectivity offers. Will PCI-E soundcards offer us the same advantages for desktops?

## Measured audio tests

We pushed the cards through the most arduous of tests – the RightMark Audio quality analysis. Here, we have run all cards on the review bench through three phases of testing resolution:

- 44.1kHz 16bit
- 96kHz 24bit
- 192kHz 32bit

We have selected these sample resolutions, as it gives the hardware the best chance it can to perform in a variety of common audio scenarios:

- 44.1kHz @ 16bit = Audio CD/MP3/general listening
- 96kHz @ 24bit = DVD-Audio, standard Blu-ray,

HD audio in games (rare currently)

- 192kHz @ 32bit = Audio engineering, high end Blu-ray

## Audio response metrics

Frequency response (from 40Hz to 15kHz, in raw dB) is the measurement of a system's response at the output point to a signal of varying frequency. This metric is often used as a way to indicate accuracy of reproduction in speakers and amplifiers. An ideal frequency response is completely 'flat', without plus or minus deviations across the injected test signal

Noise level (dB) is a measurement of absolute background noise or otherwise unintentional interference within a device. Here, the further the value falls below zero, the better. A noise measurement of -132dB is 'better' than a noise measurement of -114dB

Dynamic range (dB) is the loudest possible undistorted sound measured as a ratio against the quietest. It is really a test of the ability of an audio device to reproduce very quiet to very loud sounds instantaneously without noticeable noise, distortion or harmonic corruption

Total Harmonic Distortion (%). Harmonic distortion is a form of nonlinearity that causes unwanted signals to be added to the input signals of devices that are harmonically related to it. THD is measured on a single high purity signal in the form of a sine wave. Analysis algorithms then scan the resulting sound for any evidence of frequencies applied post generation of the original signal. For our purposes, the smaller the figure that is reported, the 'better' the audio device has performed

Intermodulation distortion (%) is a measurement designed to quantify the distortion produced by nonlinearities in the audio device tested that cause complex wave forms to produce beat frequencies. In this situation, the sum of two harmonic frequencies adds to create an interfering sound. The lower the figure, expressed in a percentage, the better

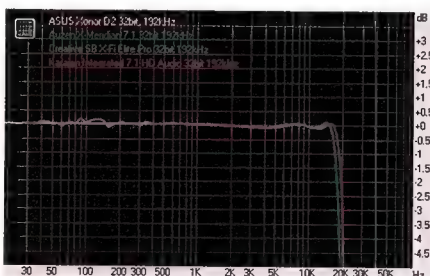


Figure 1 High end cards vs onboard frequency response (dB)

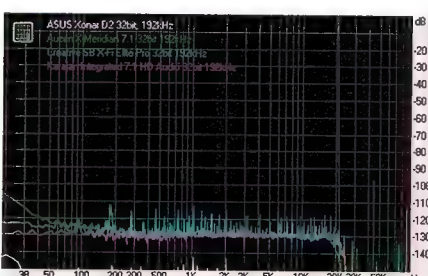


Figure 2 High end cards vs onboard noise level (dB)

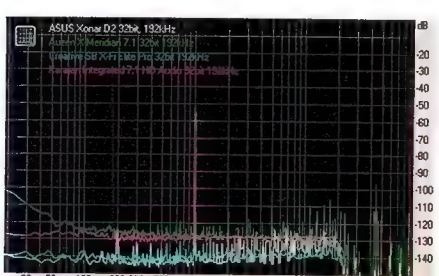


Figure 3 High end cards vs onboard dynamic range (dB)

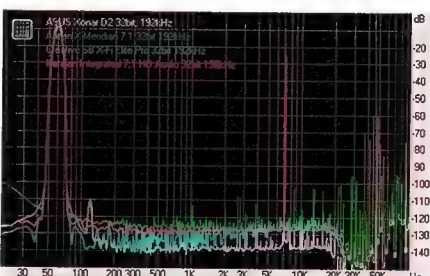


Figure 4 Total harmonic distortion High end cards vs onboard (%)

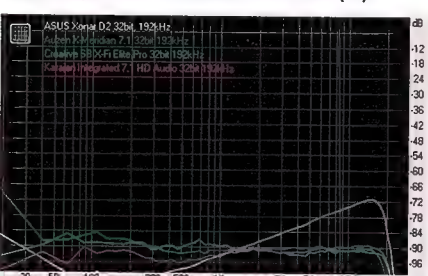


Figure 5 Intermodulation distortion High end cards vs onboard (%)

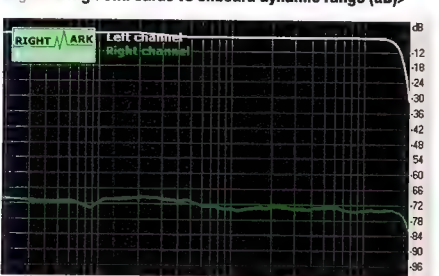


Figure 6 Stereo crosstalk high end cards vs onboard (%)

Audio Device	Format Tested	Average CPU utilisation					
		WAV	MP3	FLAC	OGG	WMA	Average CPU time
Asus Xonar D2	WAV, MP3, FLAC, OGG, WMA	5.40%	3.65%	7.04%	7.00%	3.20%	<b>5.26%</b>
Auzentech X Meridian 7.1	WAV, MP3, FLAC, OGG, WMA	6.75%	3.81%	8.01%	8.55%	4.03%	<b>6.23%</b>
Creative Audigy 4	WAV, MP3, FLAC, OGG, WMA	5.80%	4.60%	3.85%	4.40%	1.18%	<b>3.97%</b>
Creative X-fi Xtreme Gamer	WAV, MP3, FLAC, OGG, WMA	4.68%	0.30%	4.65%	3.64%	2.45%	<b>3.14%</b>
Creative X-fi Xtreme	WAV, MP3, FLAC, OGG, WMA	0.05%	0.22%	0.72%	1.45%	0.10%	<b>0.51%</b>
Creative X-Fi Elite Pro	WAV, MP3, FLAC, OGG, WMA	4.60%	5.70%	4.80%	5.32%	4.06%	<b>4.90%</b>
Onboard HD Karajan Audio	WAV, MP3, FLAC, OGG, WMA	0.46%	5.40%	1.60%	6.60%	6.88%	<b>4.19%</b>

Table 1 CPU utilisation of different devices/formats

Test	ASUS Xonar D2 32bit, 192kHz	Auzen X-Meridian 7.1 32bit 192kHz	Creative SB X-Fi Elite Pro 32bit 192kHz	Karajan Integrated 7.1 HD Audio 32bit 192kHz
Frequency response (from 40 Hz to 15 kHz), dB:	+0.21, -0.09	+0.10, -0.09	+0.06, -0.10	+0.06, -0.10
Noise level, dB (A):	-132.2	-96.7	-96.9	-96.5
Dynamic range, dB (A):	108.3	96.9	103.1	96.7
THD, %:	0.002	0.002	0.002	0.001
IMD + Noise, %:	0.256	0.256	0.252	0.252
Stereo crosstalk, dB:	-94.3	-91.3	-90.7	-94

Table 2 Comparison of high end cards @ 192kHz, 32bit Vs. Onboard

Stereo cross-talk is a metric used to determine the amount of signal leaking across from one channel (left) to the other (right). Here, the metric is measured in absolute negative whole numbers. The larger the negative, the 'better' a device performs. A result of -94 is better than a result of -4, for example

We decided to put all the high end cards against each other in the RightMark analysis graph generation tool. We've come up with some interesting figures. We contrasted the results of the high end dedicated hardware against that of the

onboard Karajan solution as a means to prove or disprove the nature of onboard sound quality.

Bingo! We have our results. Let's pick apart how the hardware performed, metric by metric! Frequency response was good across the board. Interestingly, at no point did the RightMark software deem any of the cards 'Excellent' in the frequency response test. The most that any of the cards could attain was a 'very good' rating. Even the notebook X-Fi and SB Audigy4 not shown in the comparison graphs fared very well here. An interesting side observation here is the onboard solution's apparent consistency of response compared to the other cards. Referring to Figure 1 (purple line), we see a very smooth, controlled response.

Next, we observe noise level. Figure 2 shows the relative noise of the high end cards compared

against the onboard solution. Here, the Xonar has blown the competition out of the water, by a long shot. The Xonar enjoys a -130 dB noise response, while the other cards are left meandering around -96.5dB. ASUS's proprietary shielding around its card seems to have paid off here. Contrary to popular understanding, the integrated audio dealt with noise fairly well, whereas the Creative X-Fi Elite Pro, while having a similar overall result, had a far less stable response in terms of noise and fluctuation between bands of noise.

Dynamic range has shown the Xonar as a winner again. It showed a clear advantage at 180dB of dynamic clearance compared with the Creative solution's average 96dB. Once again, the Karajan onboard showed consistency, but with a flat range and no obvious 'colour', lacking anything special to

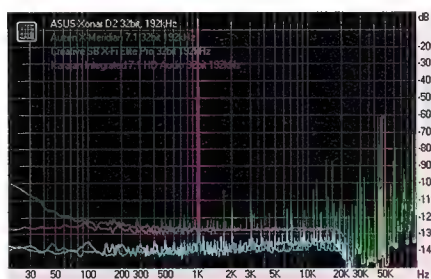


Figure 7 Stereo crosstalk, X-Fi Notebook (%)&gt;

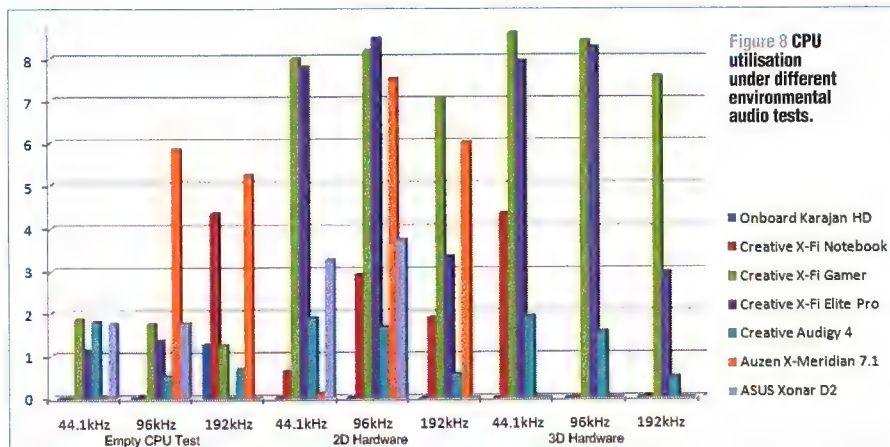
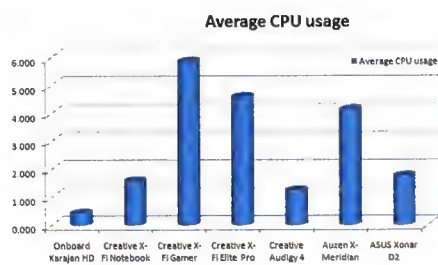


Figure 8 CPU utilisation under different environmental audio tests.

Figure 9 Cumulative average CPU utilisation across all tests, for all devices.

match the dedicated sound processing units.

Total harmonic distortion gave the integrated Karajan a chance to stretch its legs, though. With a response of 0.0007, it is the lowest THD response in the entire set of cards tested. The next best card is the Creative X-Fi Elite Pro, with a response of 0.0015. It should be noted, however, that each card scored well within the boundaries of an 'excellent' rating for THD. Our only concern was that the Karajan solution seemed to dislike a certain band or frequency, which caused an obvious spike in its distortion response. Refer to Figure 4.

Intermodulation distortion was virtually identical for all the cards including the X-Fi Notebook and X-Fi gamer, which we couldn't pack onto the graph outputs. All cards performed admirably here.

Finally, stereo cross-talk was analysed to test for channel leakage. This is something that shouldn't happen with purely digital switching internal to audio hardware these days, but it has made itself apparent in our (quite intentionally constructed) loop back tests. Unfortunately for the X-Fi notebook and the SB Audigy 4, the cards have demonstrated significant crosstalk.

## 3D hardware/CPU usage

The vendors are forever telling us about 3D positional performance in games. Most of this is exhibited in Creative's (current) EAX 5.0 format. In the olden days, 3D positional audio in games was difficult to implement and took a great deal of system resources. Now the Creative cards sport EAX, allowing developers to offload environmentally modelled audio to the sound-processing unit itself. The amount of CPU time used when running these now common environmental audio tasks is critical here. Too much utilisation of the host system CPU suggests that either the driver model is lacking, or the actual implementation of EAX used on the hardware isn't up to scratch. RightMark devised a series of tests to this effect, allowing us to see how a host system would behave when running environmental modelling tasks through the EAX hardware. For the tests, we set the buffer channels to the maximum number the card would allow. In some instances, this was 64, in others it was 128.

So at this point we need to ask ourselves if the Creative X-Fi Elite Pro's X-RAM technology has made a positive impact upon raw system resource utilisation... apparently not. Despite being able to hold the environmental sound/EAX data in RAM, rather than passing it to system resident memory it appears to have no benefit on mitigating high system resource usage aside from at the very highest sampling rate. Wonderful for 192kHz gaming, but as yet, we aren't sure of any titles that support gaming with discrete audio at 192kHz, let alone 24bit/32bit resolution of samples.

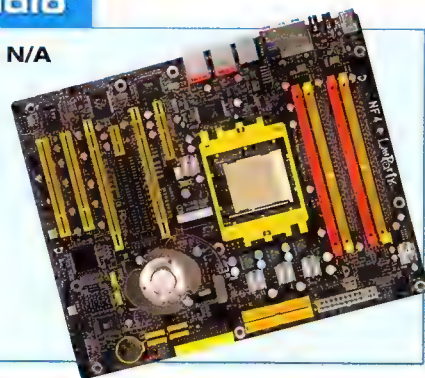
## Listening tests

At this point, we put the cards through a series of tests by simply listening to the audio through a quality set of 2.1 channel speakers. This provides a more complete insight into the nature of each sound card, as it is never enough to give the prospective buyer raw numbers to base audio

## Onboard Karajan Audio

Supplier **N/A** Website **N/A** Street Price **N/A**

The Karajan has a surprisingly warm and accurate response through most 16bit and 24bit sources. One apparent flaw was an audible but extremely high pitched ring in every obvious loud response from the speakers. Some people will hear this, others will not. For the discerning listener, this instantly rules out any usage of the device for playback, as it 'taints' the audio.



## Creative X-Fi Notebook

Supplier **Creative** Website <http://au.creative.com> Street Price **\$165**

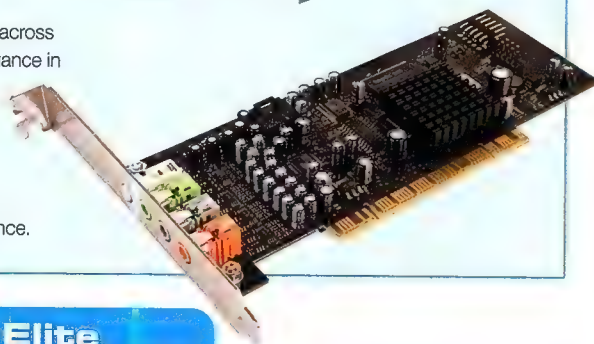
This notebook solution is clean, bright and vibrant. We felt it was perhaps a little too bright, accentuating the mid range of our test audio more than we'd like. The X-Fi notebook really was a step upwards from the onboard sound on the Dell XPS series laptop we recently tested. That said, the only purpose we can see to the card, for a mobile user, is to enable multichannel audio processing.



## Creative X-Fi Gamer

Supplier **Creative** Website <http://au.creative.com> Street Price **\$198**

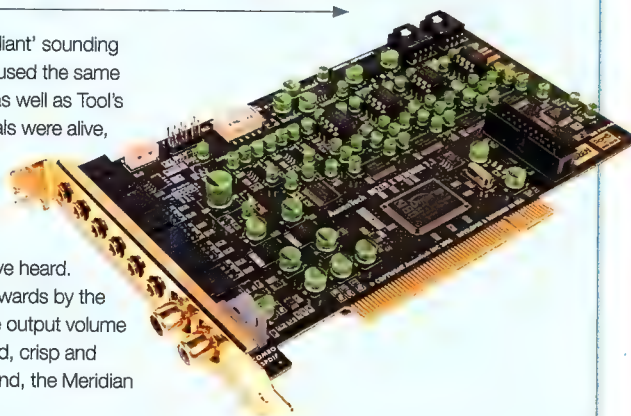
The X-Fi Gamer is a wonderful card across the board. It does have a strange nuance in output levels however, being one of the quietest devices overall. Accounting for this by raising output levels on the speakers themselves produces slightly higher natural 'hiss' in any background/silence.



## Creative X-Fi Elite

Supplier **Creative** Website <http://au.creative.com> Street Price **\$456**

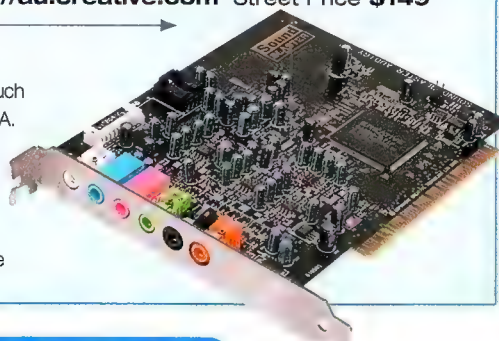
By far the loudest and most 'brilliant' sounding card we had on the bench. We used the same Dark side of the Moon DVD-A, as well as Tool's Salival DVD, to test here. Cymbals were alive, vibrant and full; drum sounds were deep, warm and rolling. Possibly more importantly, the card itself is by far the loudest single bit of audio hardware we've heard. We found ourselves blown backwards by the Meridian, with almost double the output volume of the creative hardware. For loud, crisp and stunning reproduction of 2D sound, the Meridian simply cannot be beat.



## Creative Audigy 4

Supplier **Creative** Website <http://au.creative.com> Street Price **\$149**

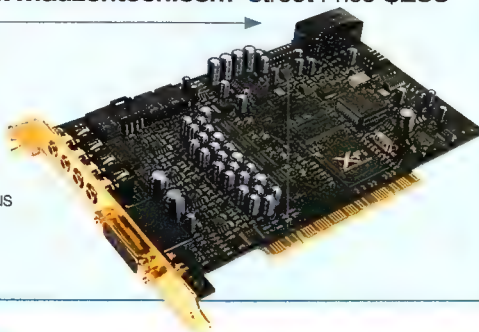
The only point where the Audigy 4 fell down was in the extremely high bitrate samples, such as Pink Floyd's Dark Side of the Moon DVD-A. At times, some very fine 'breath-like' sounds are noticeably less obvious, or fret noise from guitars is less prominent. Our numbers confirm that a very small frequency response discrepancy exists in the



## Auzentech X-Meridian 7.1

Supplier **Auzentech** Website [www.auzentech.com](http://www.auzentech.com) Street Price **\$299**

From our observations, the card 'sounded' almost identical in frequency response and range to the Gamer series of the same hardware. It may have had a slightly higher noted output level than its less complex relatives, and a slightly lower obvious distortion field.



## ASUS Xonar D2

Supplier **ASUS** Website [www.asus.com.au](http://www.asus.com.au) Street Price **\$229**

The Xonar was a strange beast, showing some odd wavering output volume behaviour. At points, even without any automatic volume adjustment turned on, the card would seemingly quieten, then randomly jump in volume again. Despite being sonically a good performer, we found it hard to overlook the volume fluctuations across all of our test content.



quality, reproduction and overall enjoyment of sound upon. See each card's box for details.


## Conclusions

This exercise in testing has highlighted many interesting aspects of sound card quality and the reality of what the vendors are offering us. Ultimately, it has proven that the raw numbers generated by high end onboard sound can come close to that of dedicated sound processing units, but the listening tests and the 3D audio acceleration stop these onboard devices in their tracks.

If you're a gamer, you'll naturally consider full blown EAX support to be important to your experience. It isn't worth skimping with onboard sound in that respect. That said, the claims about offloading of CPU cycles to SPU cycles simply aren't justified. Our results show that while you'll have all the pretty effects, wonderful positional audio and occlusion capabilities with an X-Fi, you won't necessarily see a stunning performance gain by way of less CPU/system resources used.

For the pure, unadulterated audio experience from the 2.1 perspective, Auzentech seem to be unbeatable with its Meridian X 7.1 hardware. For the non-gaming crowd, we'd be hard pressed to recommend any Creative solution with hardware like this available.

The ASUS Xonar D2 hardware made a solid effort in a hostile market but we feel it didn't deliver as far as driver stability is concerned. The heat issues coupled with its strangely wavering volume made us wonder just what went wrong.

Next time you point your browser to an online store with credit card in hand, ready to buy a new rig, consider what you really want for your ears. Gamers need depth, perception and positional accuracy. Don't skimp. Audiophiles will want transparency, accuracy of response and effervescence in their audio. The rest of us? Maybe a mixture of the two. Don't be led down the garden path or bullied into an inappropriate sound card solution for your needs. Do what your ears tell you. 

## Sound card installation, the bane of all existence

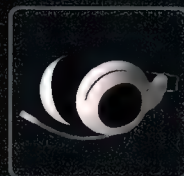
During testing we noticed some strange behaviour with several of the cards, beyond things we've already mentioned. Many experienced PC users will attest to the fact that sound card hardware and software is some of the most gear that can be put into a PC. Here's just a taste of some of the weirdness we experienced:

- The ASUS Xonar's drivers had a tendency to lock our test system up if any other audio device was the system and active
- The Xonar's impressive black protective casing, while claiming to reduce EMI and help the card superior audio, has the major fault of creating extreme heat. The card can at times become hot to touch. Should an SPU get this warm?
- The creative cards refused to operate correctly with multiple X-Fi based cards in the same system
- We noticed while testing simple Windows samples that the Auzentech Meridian crackled playing back at 192kHz. We're not sure if this is a symptom of Windows Vista, the drivers or the hardware
- The Creative Audigy series of cards will not re-detect until you run the official creative uninstaller from the original CD shipped with the card. No other utility will work. Once the driver is removed, magically 'appear' again as an installable device.

# WINNING IS EVERYTHING



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- Developed for gaming and music
- Retractable microphone
- Full-size neckband design
- Xbox 360 compatible



## steelseries IKARI LASER MOUSE



- 40.000 SPS for unbeatable tracking
- 1,8 mm lift distance
- Driverless plug-and-play
- Fully adjustable 1-3200 CPI



## steelseries 5HV<sub>2</sub>



- Soundscape engineered for gaming
- Specifically optimized for FPS games
- Pull-out microphone system
- Can be dismantled into 3 pieces

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GAMING**



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# Intel Core 2 Extreme QX9650

Josh Collins says 'asta la vista' to Kentsfield and 'sup good lookin' to Yorkfield

SPECS

**Price** \$TBA  
**Supplier** Intel  
**Website** [www.intel.com](http://www.intel.com)  
**Specifications** 45nm manufacturing process; high-K metal gate technology; 3.0GHz (333x9); 12MB L2 cache (2x6MB); SSE4 instructions; 820 million transistors; 214mm2 die size; 130W TDP

The Intel Core 2 Extreme is based on the new 45nm packaged Yorkfield core and sports an additional 50 per cent of L2 cache to create a total of 12MB shared between the two dies (2x6MB).

With the increase in cache and the move to a 45nm manufacturing process, the QX9650 not only gives a performance increase at the same frequencies in cache-dependent benchmarks when compared to the QX6850, but also runs much cooler. How much cooler you ask? Well, we decided to do something a little unusual in the Atomic labs; we actually used the stock heatsink – shock horror!

Prepared for some nasty temperatures and with our fingers poised to flip the kill-switch on the PSU at the first sign of any kind of heat spike, we began an overclocking journey. To say the least, we were both impressed and surprised. Not only did we get a monstrous 4.3GHz overclock on the stock Intel cooler, but it was also running at decent temperatures in the mid to high 50s – impressive by any one's measure.

What also impressed was the speed of the QX9650. Case in point was the processing time of many people's favourite benchmark, Super Pi 1M; a blistering 9.5s flat, at a mere 4.75GHz cooled by a single stage phase change cooler. The processor displayed similar performance to that of its 65nm brethren (Q6600, QX6700, QX6850 etc), however at a solid 450-500MHz less frequency on the core. This type of efficiency and impressive performance gain compared to a very similarly designed processor, such as the QX6850, is mainly thanks to the increase in L2 cache.

In benchmarks where the majority of the processing is done outside of the L2 cache, the performance is still strong, though nothing like the ridiculous gains found in cache-dependent applications. As mentioned, large gains were found in Super Pi 1M, but only few gains were found in

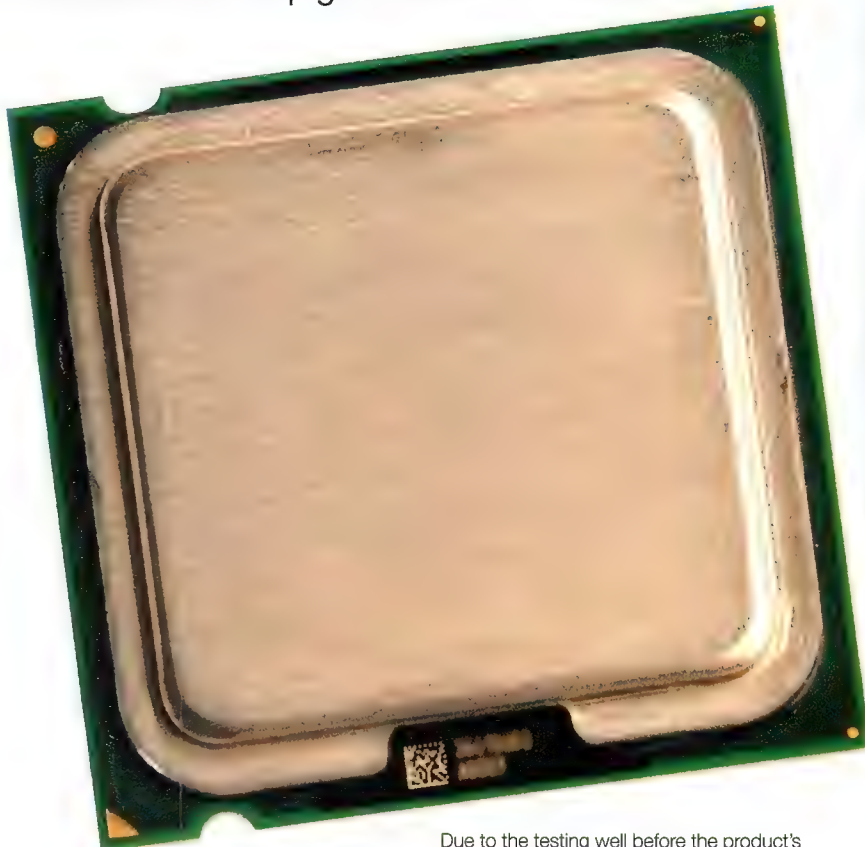
Super Pi 32M.

Power consumption is another strong point of this new processor. Due to the die shrink and the use of high-K metal gates, much less power is used by the processor. This is a contributing factor to the processor's ability to run at relatively cool temperatures while overclocked. After all, it's the increase in voltage that leads to the majority of the spiked increase in temperatures from overclocked chips. Running on a meagre 1.1v BIOS set vcore, the processor happily overclocked to a whopping 3.8GHz – impressive to say the least.

With Intel producing such massively overclockable chips, we are pants-wettingly excited by the thought this will bring even more people into the overclocking fold. What's more, we're also looking forward to watching a renewed battle for national and world records as the new chips begin to hit the overclocking scene.

Due to the testing well before the product's official release (so that you can read about it now), many motherboards, even those from the two largest companies in the game, GIGABYTE and ASUS, appear to have some difficulties fully recognising the CPU. Essentially, the big manufacturers have not had enough time to get their BIOSes in shape to keep up with this spry chip and its blistering speed. The CPU was comfortably hitting the high speeds we've raved about, and stably so, but the motherboards couldn't handle it; the max bootable FSB is considerably low and strap change holes are very apparent.

The best performing board with this processor at the time of testing was the GIGABYTE GA-X38T-DQ6. It managed the highest FSB of the lot, at 400MHz bootable, and could still be raised to 475MHz from within Windows. This is a suspiciously high gain to achieve within Windows, and supports the strap change issues theory. (E)



Intel Core 2 Extreme QX9650

	333x9; DDR2-1066 4-4-4-10	333x10; DDR2-1066 4-4-4-10	333x11; DDR2-1066 4-4-4-10	333x12; DDR2-1066 4-4-4-10	333x13; DDR2-1066 4-4-4-10	333x14; DDR2-1066 4-4-4-10
<b>3DMark06 CPU score</b>	4986	5429	6010	6557	7089	7669
<b>Super Pi 4M</b>	1m 24.453s	1m 17.203s	1m 11.485s	1m 06.687s	1m 02.625s	59.093s
<b>wPrime 32M*</b>	14.328s	12.844s	11.624s	10.703s	9.875s	9.187s
<b>CineBench R10 single thread</b>	3312	3669	4043	4407	4769	5139
<b>CineBench R10 multi thread</b>	11795	13116	14317	15624	16853	17800



# **SwordM**

VD5000 Series

## **Witness the Legacy**



The Thermaltake SwordM full-tower PC case is a true reflection of the contrast between technological advances and the artistic quality of superior craftsmanship.

This Limited Edition, handmade, all-aluminium, extrusion-built case is available in two models: one with and one without in-built liquid cooling. The VD5001BNA features an advanced liquid cooling system for the highest performance and the most silent operation.

The SwordM also features hydraulic mechanisms on the top and side panels for easy installation as well as a tool-free design.

The case includes provision for up to 12 x 5.25" drive bays with detachable HDD cage.

The specially designed 7" drive bay expands to support a retractable touch-screen LCD monitor for dual screen operation (optional).

The styling of the SwordM is derived from the streamlined curves found on the swords of ancient Chinese warriors. This superior styling is only made possible through the utilisation of handcrafting. Own a piece of history by taking a SwordM home today!



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# ASUS Maximus Formula

Josh Collins asks the ever important question: "Are we not merciful?!" He also rates this mobo.

## SPECIFICATIONS

Socket 775; Intel X38 northbridge; ICH9R southbridge; ATX form factor; 2x PCIe 16x; 2 x PCI; 3 x PCIe x 1 (one dedicated to SupremeFX sound card); 1 x EIDE; 6 x SATA; 1,333MHz FSB; DDR2-1200.  
price TBA  
street price \$457  
supplier ASUS  
website [www.asus.com](http://www.asus.com)

**B**oasting the grandiose name Maximus Formula, this mobo from ASUS is the bigger brother of the Blitz Formula in the Bearlake chipset world. Based on the X38 northbridge, opposed to the Blitz's P35 north bridge, and using the same ICH9R southbridge, this new addition to the ASUS Republic of Gamers line brings with it some new functionality.

The real big news, as you might guess from the inclusion of the X38 chipset, is the inclusion of true 16x electrical dual PCI-E graphics slots, with CrossFire capability. This is opposed to the 16x plus 4x, 16x plus 8x or 8x plus 8x configurations we've seen on Intel-based chipsets recently. The last northbridge to have true dual 16x electrical (16x plus 16x) capability was the old 975X chipset.

Add to this the inclusion of the first PCI-E 2.0 specification for next generation GPUs and support for the upcoming 45nm processors, and the stage is set for a board ready to take on the next wave of new tech. Technically, however, the only notable feature out of these last two is the PCI-E 2.0 inclusion; the P35 is also capable of running the upcoming 45nm processors – after all, they're both Bearlake-based.

Looking at the board as a whole, the layout is pretty much what we've come to expect from ASUS and especially from the ROG series; simply put, it's superb. Everything is taken into account, from double spacing between the PCI-E slots, to the SATA ports set at a right angle on the edge of the board and the always welcome on/off, reset

and clear CMOS switches, the standard for the ROG series these days.

Performance-wise, the Maximus Formula left a little to be desired. Like the results seen from the GIGABYTE GA-X38-DQ6 last month, when the X38 northbridge is paired with DDR2, a P35 based DDR2 system can equal or better the performance of the X38 chipset. This is reflected across the board, not just between the Maximus Formula and Blitz Formula; but in this specific instance we did discover some interesting findings.


With both boards equipped with lab-standard Core 2 Duo, Corsair Dominator memory and other test hardware we were rather bewildered; the Blitz was not only faster in direct comparison, but overlocked further as well. How much further could the Blitz overclock you ask – how does an extra

20MHz on the max FSB sound? Unsure as to whether this was perhaps a cooling issue; we used direct air cooling over all northbridge and MOSFET heatsinks.

Additionally, we put the CPU under a Kayl-built Frozen SS phase cooling unit. The Maximus peaked at 530MHz FSB bench-stable, and could be raised to 550FSB from within Windows, using SetFSB, though this was not benchmark stable above 530MHz. In comparison, the Blitz Formula does 550MHz FSB with the processor under air cooling and has been clocked at 593MHz FSB in recent times using a processor under dry ice cooling.

From our initial testing, we believe the issue with the comparatively low FSB overclocking to be due to the way in which the chipset handles the memory addressing and chipset latency timings. This is because X38, as specified by Intel, was designed for use with DDR3 and board partners then engineered the ability to utilise DDR2 on this chipset.

For the reasons explained so far, we believe that if you're looking at purchasing the Maximus, make the jump to DDR3 as you'll see a better performance return for the money invested into the system. If you're looking at a strong overclocking motherboard for a DDR2 system, go with the Blitz Formula instead.

The Maximus Formula is, with out any doubt, a very well engineered board and performs admirably. However, for the price, we really expected it to out-perform its P35 brethren. 

	333x9; DDR2-1000 4-4-4-10	500x6; DDR2-1000 4-4-4-10	520x6; DDR2-1040 4-4-4-10
3DMark06	11308	11359	11478
Super Pi 4M	1min 36.797s	1m 30.703s	1m 27.078s
wPrime 32M	29.657s	29.484s	28.234
Everest read	8547MB/s	8687MB/s	8981MB/s
Everest write	6098MB/s	7971MB/s	8288MB/s
Everest latency	63.2ns	100.5ns	96.9ns
CineBench R10 – Single Thread	3086	3079	3197
CineBench R10 – Multi Thread	5903	5889	6115

**SCORE**  
**8.0**  
OUT OF 10

# NVIDIA 8800GT

## SPECS

**Price** TBA  
**Supplier** NVIDIA  
**Website** [www.nvidia.com](http://www.nvidia.com)  
**Specifications** 600MHz core;  
 1500MHz shader; 900MHz  
 (1800MHz data rate) memory;  
 65nm manufacturing process;  
 112 Stream Processors; 512MB  
 GDDR3; single 6-pin PCI-E power;  
 single slot cooler; 22.86cm long;  
 110W power draw; 2x Dual Link  
 DVI; HDTV-Out

**H**ot off the conveyor belt and straight to the labs just before deadline, we simply had to include the recently released 8800GT in this issue.

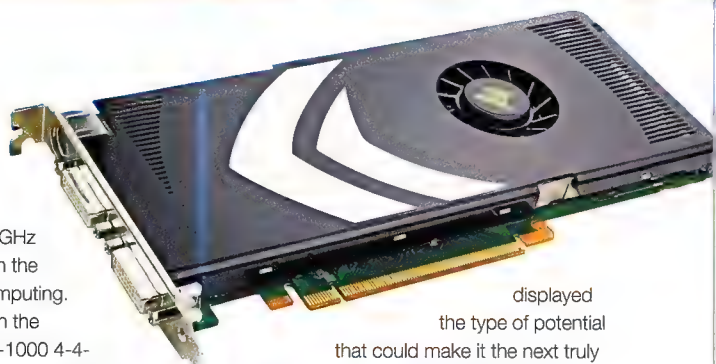
Described by NVIDIA CEO Jen-Hsun Huang as the next Ti4200 as the kind of card that only appears after the discovery of an apparent gap between GPU generations that has seen consistently high performance advancements, we were excited to – say the least – after just checking out the specifications. Jetting back from NVIDIA HQ in Santa Clara, CA, USA and carrying the 8800GT close to our chest, the little bugger was benched as soon as possible.

Thrown into the deep end and with time a precious commodity, we decided it was best to observe the scaling capability of the 8800GT reference card at stock frequencies and only using

CPU-related bandwidth to scale the scores while testing with 3DMark06.

We tested a Core 2 Duo at 3GHz, 3.6GHz, 4GHz and 4.5GHz – all common frequencies within the varying levels of enthusiast computing. All benchmarks were done with the memory set as close to DDR2-1000 4-4-4 as possible – this was available for all runs with the exception of the 4GHz run, where dividers forced the memory to run at DDR2-1068 4-4-4-4.

The first score recorded, at the rather standard and moderate frequency (at least for the enthusiast) of 3GHz, was a stunner. We managed to clock in a whopping 11.5k 3DMark06 result; from a card destined to have an extremely strong value price point, we were shocked and in a little bit in awe. From the get-go, this card already



displayed the type of potential that could make it the next truly massive seller, at least since the legendary Ti4200.

Scaling upwards, we were happily met by an eventual score of 12.7k at stock frequencies with the CPU at 4.5GHz – wow. Just... wow.

Knowing we hadn't the time or page space to truly give this card the glory it deserves, we've chosen to utilise this as a teaser – stay tuned for a round up of 8800GT cards from all you favourite manufacturers next issue! **JC**

	333x9; DDR2-1000 4-4-4-4	400x9; DDR2-1000 4-4-4-4	445x9; DDR2-1068 4-4-4-4	500x9; DDR2-1000 4-4-4-4
<b>3DMark06 Overall score</b>	11,552	12,119	12,441	12,746
<b>3DMark06 SM 2.0 score</b>	5,379	5,418	5,451	5,474
<b>3DMark06 SM 3.0 score</b>	5,157	5,198	5,214	5,228
<b>3DMark06 CPU score</b>	2,724	3,249	3,611	4,021

# Cooler Master Cosmos 1000

## SPECS

**Price** \$275  
**Supplier** Australia IT  
**Website** [www.australiait.com.au](http://www.australiait.com.au)  
**Specifications** (W) 266 x (H) 598 x (D) 628 mm; 16.9kg Net; steel and aluminium; ATX and E-ATX compatible; 4x 5.25in drive bays (external); 1x 3.5in drive bay (external); 6x 3.5in drive bays (internal); 4x 120mm case fans (1 x bottom, 1 x rear, 2 x top); silver with black highlights

**I**f calling this case the Cosmos wasn't already enough to give it a sense of grandeur, then slapping the number 1000 on the end should surely do the job – right?

Naming schemes aside, from the very first moment we took the Cosmos out of the box it had a luxury liner-like feel and presence. The case is bold and forthright, but still elegantly streamlined. You can imagine the Cosmos gliding along effortlessly through the highest seas, while knowing there is a significant mass behind it.

You might want to avoid icebergs, though.

The fascia of the case is classy. The door covering the front drive bays is constructed of silver toned brushed aluminium. It offers an almost perfect balance between the solidity of a bank vault, but maintains the light feel of a dojo's rice-paper door.

Inset down the middle of this door, and taking

up the majority of the front panel, is a strip of mirror finished black perspex. This sets off the black stripe that runs down the middle of the case.

The side panels are lightweight, with sound dampening foam stuck to both the left and right panels.

The interior is neatly compartmentalised; the 5.25in drive bays boast completely tool-less design in the conventional upper front placing; the 3.5in bays for HDDs are placed in a compartment in the lower front of the case. These bays are set in two sets of three and slide out in individual trays, with silicon mounts to assure vibration dampening.

The Cosmos can also blow a truly meteorological amount of air through the interior. The case includes a total of four 120mm fans, with one acting as an intake on the bottom-front of the case. The second is in the traditional rear exhaust position, and the last two are placed as exhaust fans in the top of the case.

And for those looking to get their water cooling on (and really, why wouldn't you?), the case includes two rubber grommets in the rear, just above the 120mm exhaust fan, for one inlet and one outlet tube.

At the end of the day this is a structurally sound offering with a finish to ensure even the most delicate of geekish hands don't get cut while tooling up their new case. **JC**



**SCORE**  
**8.0**  
 OUT OF 10



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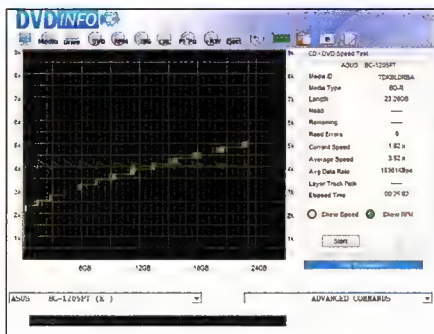
# ASUS BC-1205PT Blu-ray combo

SPECS

Price \$320  
 Supplier ASUS  
 Website [www.asus.com](http://www.asus.com)  
 Specifications 5x BD-ROM; 12x DVD+/-R; 6x DVD-RW; 4x DVD-R DL; 5x DVD-RAM; CD-R 32x

ASUS is about to unleash a Blu-ray reading combo drive onto the market, which offers up a tempting Blu-ray player/reader as well as all the standard DVD and CD writer capabilities that we now all take for granted. One thing you should note right up front is that the BC-1205PT is essentially a re-badged Pioneer BDC-202.

We tested the unit with several Blu-ray titles such as Ice Age 2, Hero, 300 and the Chronicles of Narnia. At a viewing resolution of 1920 x 1080 native 1080p, we were expectedly stunned by the clarity, sharpness and contrast in the motion video. Our HDCP compliant Dell 24in was the display panel of choice here. Audio was presented to us in 24bit 96kHz through our Creative X-Fi Elite Pro hardware.



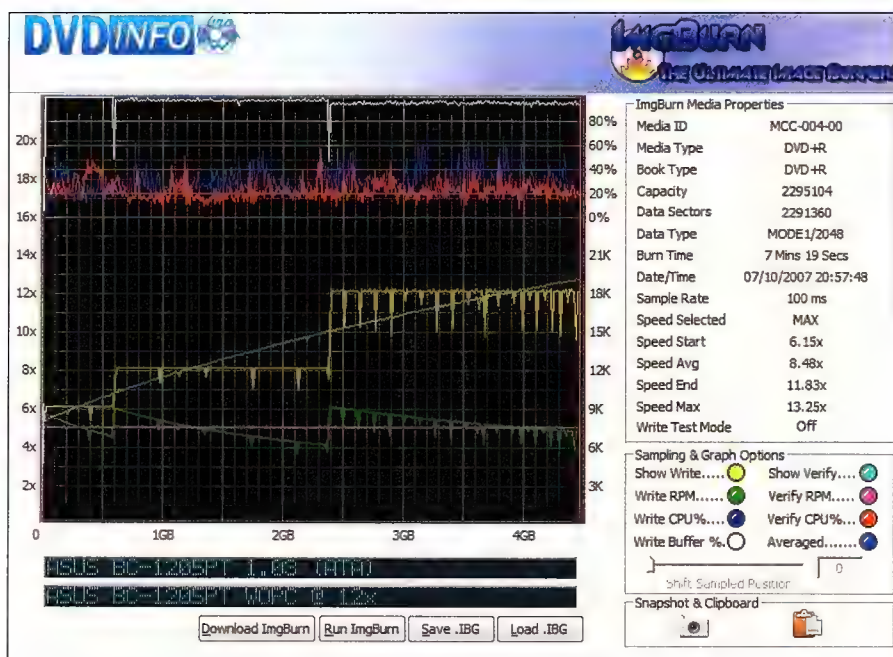
Blu-ray reading RPM curve.

We did note that playback, even current generation CPUs, couldn't be totally offloaded to the GPU. Rather, we ended up with around a 15 to 19 per cent CPU utilisation between an AMD x2 4600+ system and an Intel Core2Duo E6550 system.

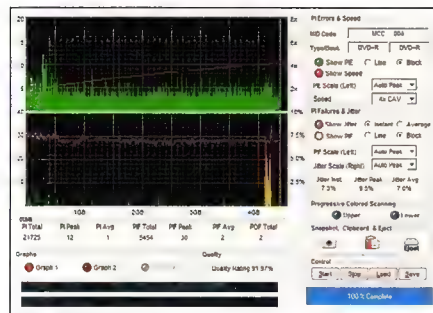
The unit came packaged with Cyberlink's BD Solution, giving us an 'all in one' burning and playback installer. This was inclusive of the high definition enabled version of Cyberlink's PowerDVD 7.3.

We tested the physical playback speed of a Blu-ray disc and graphed the RPM, where we noted the drive going beyond the maximum 5x read speed for BD-ROM. Figure 1 shows a strange graduation of the read curve, suggesting that Blu-ray reading in itself has some fairly complex WOPC taking place at approximately 1GB intervals.

We tested the write quality of the device also, against some differing DVD media MID's.



WOPC @ 12x, MCC004.



Parity and jitter data @ 12x MCC004.

Apart from the parity spike near the 4.2GB point (which isn't outside of specification), we were extremely pleased with the drive's generic DVD write performance.

Ultimately, only the unit pricing will determine whether or not to buy it over its identical relative, the Pioneer BDC-202/S02. The ASUS BC-1205PT is a very capable unit, representing a step beyond the current HD-DVD add on for the XBOX-360/PC. **Jake Carroll**

**SCORE 8.0 OUT OF 10**



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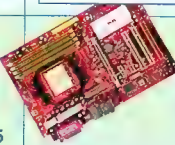


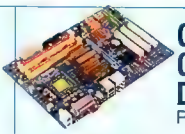

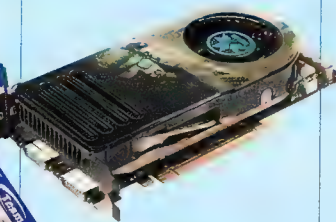





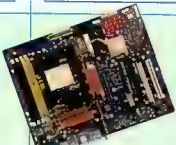


# ATOMIC KITLOG

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land has to offer

**T**here's nothing sexier than new kit. And whether you need to horde your pennies (Budget), want the most power for your dollar (Performance) or own a small mansion and

a collection of sports cars (Extreme), we're here to help with this handy matrix of *Atomic* recommended products. You may find your needs fall between categories – that's okay,

just mix and match to suit your budget! Each piece of kit has been reviewed hands-on in *Atomic*, so if you want to learn more, look up the issue and page number listed.

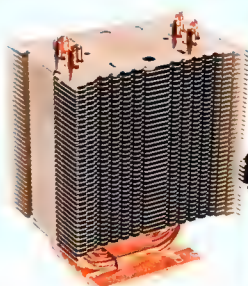
		CPUs	Motherboards	Memory	Video cards
<b>BUDGET</b> I can't afford to eat... gimme gear!	intel	 <b>Intel Core 2 Duo</b> PRICE \$100-\$480 Stretch a little further and buy yourself a Core 2 Duo – you'll be thanking yourself later. The E4400 is the cheap ticket to speed, at \$165.  Reviewed in Issue 81 – Page 52	 <b>GIGABYTE GA-G33M-DS2R</b> PRICE: \$165 Using the G33 northbridge and has overclocking performance like its full ATX brethren, this Micro-ATX offering is extraordinarily hard to pass up.  Reviewed in Issue 81 – Page 52	 <b>Corsair XMS2</b>	 <b>Powercolor X1950 Pro</b> PRICE \$245 The X1950 Pro is nothing short of fantastic. Mind you, this could just as easily be the 7950GT, so watch this space in case the NVIDIA card drops in price.  Reviewed in Issue 71 – Page 47
	AMD	 <b>AMD Athlon 64 AM2 X2</b> PRICE \$135-\$335 Cheap CPUs are a wonderful thing, and the X2s are now wonderfully cheap. The 3600+ is your budget baby at about \$85.  Reviewed in Issue 68 – Page 33	 <b>MSI K9N Neo F</b> PRICE \$113 Excellent performance from a budget board, with plenty of legacy slots for upgraders. Don't expect to overclock though.  Reviewed in Issue 68 – Page 33	 <b>Corsair Twin2X 1024MB 6400 Pro</b> PRICE \$198 Corsair has a history of providing nice, stable and fiesty sticks of random access memory joy. These RAM sticks are EPP compliant, have low latency and are nicely overclockable. 800MHz of fun for everyone!  Reviewed in Issue 69 – Page 51	<b>Powercolor X1950 Pro</b> PRICE \$245 The X1950 Pro is nothing short of fantastic. Mind you, this could just as easily be the 7950GT, so watch this space in case the NVIDIA card drops in price.  Reviewed in Issue 71 – Page 47
<b>PERFORMANCE</b> Hardware that bangs the best for buck.	intel	 <b>Intel Core 2 Quad</b> PRICE \$300-\$680 Core 2 Quad – a processing powerhouse, now affordable and overclockable like buggery. The Q6600 is the best buy, at about \$336.  Reviewed in Issue 80 – Page 55	 <b>Gigabyte GA-P35-DS3R</b> PRICE \$200 The P35-DS3R is a cheap overclocker that can't be ignored. Buy a Core 2 Quad Q6600 and go nuts!  Reviewed in Issue 80 – Page 55	 <b>TEAM Xtreem Dark PC2-6400 C4</b> PRICE \$289 Cheap, overclockable and good lookin' to boot. The modules fill the void that was previously left between cheap value RAM and enthusiast overclocking kits.  Reviewed in Issue 80 – Page 56	 <b>GeForce 8800GTS 320MB</b> PRICE \$410 DirectX 10 for the mainstream. 320MB is as good as 640MB in most situations – opt for the 640MB if you're going to play above 1600x1200.  Reviewed in Issue 76 – Page 58
	AMD	 <b>AMD Athlon 64 AM2 X2</b> PRICE \$135-\$335 The X2 series are still fantastic chips, and in the face of the Intel threat are now going for cheap. The 6000+ is your current sweet spot at about \$235.  Reviewed in Issue 66 – Page 39	 <b>Gigabyte GA-M59SLI-S5</b> PRICE \$250 Gigabyte delivers yet another affordable, feature-filled wonder of the 21st century.  Reviewed in Issue 66 – Page 39	 <b>TEAM Xtreem Dark PC2-6400 C4</b> PRICE \$289 Cheap, overclockable and good lookin' to boot. The modules fill the void that was previously left between cheap value RAM and enthusiast overclocking kits.  Reviewed in Issue 80 – Page 56	 <b>GeForce 8800GTS 320MB</b> PRICE \$410 DirectX 10 for the mainstream. 320MB is as good as 640MB in most situations – opt for the 640MB if you're going to play above 1600x1200.  Reviewed in Issue 76 – Page 58
<b>EXTREME</b> Gimme power. Money is no object.	intel	 <b>Intel Core 2 Extreme QX9650</b> PRICE \$TBC The cream of the overclocking crop, based on the new Yorkfield architecture. Truly, Lord of the CPUs.  Reviewed in Issue 83 – Page 53	 <b>EVGA nForce 680i</b> PRICE \$435 Stupidly over-featured and fast, if you've got the cash, then plunk it down here.  Reviewed in Issue 72 – Page 47	 <b>Corsair Dominator Twin2X 10,000</b> PRICE \$1016 Crazy speed sticks that will also happily do 1T/800MHz/3-3-3-3. Comes with a fan attachment to keep things cool!  Reviewed in Issue 77 – Page 58	 <b>XFX GeForce 8800GTX Ultra XXX Edition SLI</b> PRICE \$1459x2 This is far and away the most powerful graphics card on the market, but be willing to sacrifice your entire retirement fund for the privilege of having one of these tearing up your screen.  Reviewed in Issue 78 – Page 59
	AMD	 <b>AMD Athlon 64 FX-62</b> PRICE \$1072 Sadly gets beaten by a mid range Core 2 Duo, but still the top of AMD's pile.  Reviewed in Issue 66 – Page 39	 <b>ASUS M2N32 SLI Deluxe</b> PRICE \$290 Perfection in a motherboard. Beautifully laid out and overclockable to boot.  Reviewed in Issue 68 – Page 35	 <b>Corsair Dominator Twin2X 10,000</b> PRICE \$1016 Crazy speed sticks that will also happily do 1T/800MHz/3-3-3-3. Comes with a fan attachment to keep things cool!  Reviewed in Issue 77 – Page 58	 <b>XFX GeForce 8800GTX Ultra XXX Edition SLI</b> PRICE \$1459x2 This is far and away the most powerful graphics card on the market, but be willing to sacrifice your entire retirement fund for the privilege of having one of these tearing up your screen.  Reviewed in Issue 78 – Page 59

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## Coolers



**Noctua NH-U9F**  
PRICE \$80

It may only be 90mm, but its cooling power is exemplary, coming in only slightly behind its 120mm brother.

Reviewed in Issue 72 - Page 42

## System drives



**Samsung HD160JJ**  
**160GB**  
PRICE \$80

Super quiet and yet still fast, the 160GB Samsung offers excellent value for money.

Reviewed in Issue 69 - Page 40

## Displays



**Samsung 931C**  
PRICE \$405

2ms of raging colour gamuts and beautifully smooth tonality that will make you weep with joy and hug strangers.

Reviewed in Issue 70 - Page 56

## Speakers



**Steelcase 5Hv2**  
PRICE \$120

Awesome gaming audio performance on a shoestring budget. Phenomenal 'phones.

Reviewed in Issue 73 - Page 43

## Cases



**Lian Li PC-7S**  
PRICE \$138

Quality, elegance, refinement and style. The trademarks of a Lian Li case, now available at an entry-level price.

Reviewed in Issue 79 - Page 46

**Thermalright Ultra 120**

PRICE \$75

Tower cooling that will keep your tower cool. Whack a Nexus 120mm fan on for near silent cooling.

Reviewed in Issue 72 - Page 42

**Thermalright Ultra 120**

PRICE \$85

Make sure you get the optional AM2 bracket (hence the higher price). Grab that same Nexus fan.

Reviewed in Issue 72 - Page 42



**Seagate Barracuda 7200.10 320GB**  
PRICE \$130

Seagate's fancy new technology makes this beast both fat and fast. Mmm, toasty.

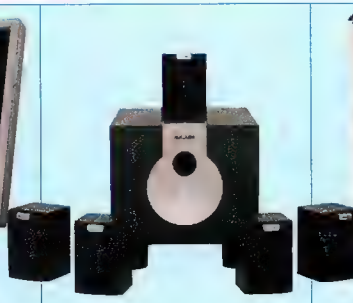
Reviewed in Issue 69 - Page 40



**Samsung 244T**  
PRICE \$1477

Brilliance at 24", the 244T offers 6ms gaming, a wonderful gamut and more inputs than an alien hooker.

Reviewed in Issue 69 - Page 48



**AVLabs AVL325**  
PRICE \$165

While it can't hold a candle to the Z-5500D, with a price this low there's no excuse not to jump to 5.1.

Reviewed in Issue 64 - Page 50



**Cooler Master Stacker 830**  
PRICE \$290

Like the Stacker before it, this sensational Stacker stacks sumptuous specifications salaciously.

Reviewed in Issue 61 - Page 36

**Asetek Vapochill Lightspeed**

PRICE \$1020

Vapour phase change. Ooooh. Vapour. Phase. Change. No matter how many times you say it, it's still cool (punt!)

Reviewed in Issue 64 - Page 38

**Cool-Trek Vostok**

PRICE \$199

Until more extreme cooling systems come along that are AM2 compatible, this little kit will have to fill the gap. Make sure you get the updated mounting kit.

Reviewed in Issue 68 - Page 41



**Western Digital Raptor WD1500AFD**  
PRICE \$330x2

Dear lord. The performance king hath cometh, short of whacking in a SCSI. Buy two and RAID 'em.

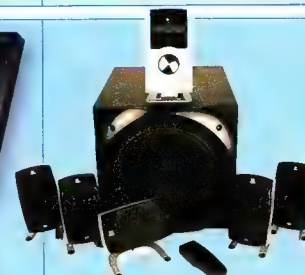
Reviewed in Issue 62 - Page 40



**Hewlett Packard LP3065**  
PRICE \$2718

Thirty inches, 2560 x 1600, 8ms G2G. If you can handle the size and cost to run this massive beauty, you won't be disappointed.

Reviewed in Issue 76 - Page 53



**Logitech Z-5500D**  
PRICE \$430

Able to play the 'liquid gold' that is DTS 96KHz/24-bit, this 5.1 beast can wreck both home and hearing alike with equal impunity.

Reviewed in Issue 48 - Page 56



**Silverstone TJ07**  
PRICE \$420

The Silverstone Temjin TJ07 is a huge hulking beast that shows you mean business in the finest style. Impeccable finish and plenty of room means win.

Reviewed in Issue 65 - Page 49

# THE CHIPPERY

Silicon wars and opinion from the electron trenches.



## The time is right

**Josh Collins** looks upon the coming of a second renaissance. And it is good.

For the past 15 years the online world has been expanding, developing, evolving and perhaps most interesting of all, growing out of its cyber shell; slowly progressing toward directly and actively influencing the physical world.

This influence however is a two way exchange. As the virtual world presses outwards the physical world progresses into its own digital revolution – pushing ever so many more concepts and social beliefs into the games and other entertainments we all enjoy online.

One of the most beautiful, yet also most ugly, is the development and coming of age of the e-sports genre and concept. Still in its infancy but older than other developments from online to real world, the cyber sports scene depicts everything you would expect from a true physical sport. Training, team management, strategies and planning, the competitions – both virtual and physical – and perhaps the most influencing of all: the sponsorship and with it, also, the marketing.

As with most young ideas, sponsorship and marketing can be a make or break influence. You'll see 'sell outs' lap up the perks while others 'keep it real' and maintain their independence. Which ever side of the coin they land on, both situations have different positive and negative influences on an individual and the industry or the concept they're engaging in; this has already been observed in e-sports.

Now it seems the next niche to make the progression from virtual to physical fame from the enthusiast computing space is overclocking.

A concept once used to obtain a higher overall performance level from a computer system by running hardware above the rated specifications has now grown into a highly competitive and specialised field. This sector has harnessed the power of online influence and collectively grown to encourage progression, ingenuity and conceptual advancements in areas such as component cooling, system configuration and hardware design.

It was undoubtedly only a matter of time before the big players began to take notice. Two definitive turning points in the creation of 'Professional Overclocking' have come from the eventual acceptance by the hardware manufacturers that this was no fad and followed by the progressive turn around to actively support

the notion of overclocking.

This back flip by the industry has been a slow one, however there have certainly been recent events that have acted as catalysts to the increased exposure and growth of support for high level overclockers.

Notable events include the use of overclockers to demonstrate the performance of highly tweaked systems at industry trade shows such as

CeBIT and Computex. Further, we've even seen the use of top level overclockers as a from of 'poster child' for hardware manufacturers, such examples include renowned 3D benchmarker 'k1ngp1n' becoming involved in the launch of the NVIDIA 8800 series graphics cards. During this he starred in the 'NVIDIA priceless' video. Another moment of triumph for the overclocking community was the recent inclusion of revered overclocker 'Fugger' at the Intel Developer's Forum (IDF), where he overclocked Intel's Core 2 Extreme QX9650 during Paul Otellini's key note presentation.

Hold that thought for a moment – overclocking encouraged during Paul Otellini's presentation.

Ladies and gentlemen, overclocking has officially arrived.

For decades, Intel has been the most persistent in discouraging overclocking. Now, with a back flip better than Anna Pavlova, they're openly endorsing the concept, and embracing the community that has pioneered it – but I don't suppose the warranty terms and conditions are going to change any time soon, however.

As the big players begin to open the doors for those lucky enough to be in a position to take advantage of it, as enthusiasts, we can all only sit back, hold tight and enjoy the ride.

Here's to the second coming. 

Josh is a true renaissance man. He regularly wears a doublet and cod piece in the office.

[jcollins@atomicmpc.com.au](mailto:jcollins@atomicmpc.com.au)



“The next niche to make the progression from virtual to real fame is over-clocking”



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## GROUND ZERO

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# Protect the WiFi wilderness!

Daniel Rutter cares about the environment. So should you.

An endangered species is struggling for its life in suburbia today. It's still not hard to find if you're patient, even in the most congested cities. But the encroachment of selfish humans threatens to snuff it out altogether. Without careful conservation measures, it will soon become extinct.

I speak, of course, of the unsecured wireless access point.

Whether of the common 'Netgear' or 'D-Link' variety, or a more exotic breed, unsecured APs are a precious natural resource.

Like our forests and fisheries, unsecured APs are vulnerable to thoughtless exploitation. It only takes a couple of hours of porn downloading to completely exhaust the bandwidth allowance of many "unlimited" Internet accounts.

Since the kind of user who leaves their AP unsecured is probably also the kind of user who signs up with one of those ISPs that advertise during late-night reality TV, the 'excess data' fee is probably \$130 a gigabyte.

When the bill comes, that poor little access point will probably be torn bodily from the wall and thrown out a window.

Many ISPs are also surprisingly intolerant of business use of open APs. Why, you often won't even be able to send three million 100 per cent legitimate double-opt-in invitations to purchase extremely good value replica wristwatches before the ISP pulls the plug.

But there are other, subtler threats. The mainstream media, for instance, are trampling the fragile electronic environment. They're starting to actually tell people about wireless network security.

It didn't used to be this way. The papers and TV used to just run stories about how wireless networking was a key terrorist technology. Or they sensibly warned their readers – strangely only during the ratings season – about the well-established links between wireless network 'electrosmog' and, what it's meant to cause this week. Autism or something?

To their credit, some networks are still doing the right thing. Making proper computer shows, the kind with the word 'Cyber' in the title, with presenters who put comforting air quotes around scary words like 'Skype' and 'Wi-Fi'.

That's the kind of responsible reporting the electronic environmentalist

movement firmly supports. But other TV and newspaper pieces, even if they do still warn you that the word 'router' is only for use by 'boffins', disturbingly go on to explain about wireless network security.

And not just by telling you to turn off SSID broadcast and unplug your AP when you go to bed. Oh, no. Some of them even explain about more than one kind of WPA!

“And a thousand innocent APs cry out in terror - and are suddenly silenced.”

And a thousand innocent open APs cry out in terror – and are suddenly silenced.

You might not think this is a problem, just because you can still find dozens of unsecured networks if you walk through any Australian capital with a Nintendo DS. Or perhaps you still don't even have to use a piece of Chinese cookware to connect to three of your neighbours' APs.

But with each passing month, those free, untamed, beautiful networks become fewer. Like the Tasmanian tiger, the unpassworded corporate dial-up line and the free SMS gateways, they may soon die out altogether. *But it's not too late!*

When you next notice that the power plug of your DSL adapter has fallen out but you've still got Internet access, and then discover that your computer's helpfully connected you to next door's

open AP with a default name and an unpassworded router at 192.168.0.1, nurture and cherish this frail little creature.

Download only what you really need.

Send only the spam that absolutely cannot wait.

No matter how much ink cartridges cost, don't send your photos to their network printer and break into their house to collect them.

And whatever you do, don't change the SSID to "Please secure this access point!"

The survival of this critically endangered species depends on all of us.



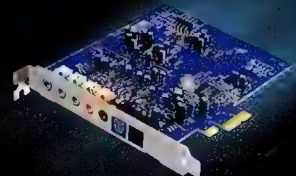
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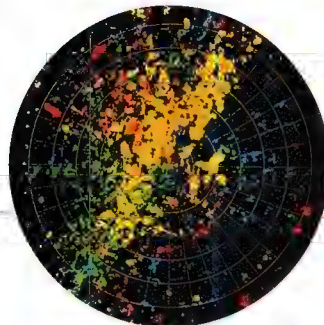
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# GAMEPLAY

## GAMES, GAMING AND GAMERS COVERED ATOMIC-STYLE

It's a bad time of year to be a game reviewer. There are just so many top titles coming out that it becomes almost impossible to cover them all! But, we at Atomic are a tough crowd, and we're giving it our best shot.

This month we kick off with the much anticipated Team Fortress 2, wherein we discover if the long wait has been worth it. We also look at Half Life 2

Episode 2 to see if the ongoing saga of Gordon Freeman is still kicking along. Both titles are in Valve's super-value Orange Box collection, but they most certainly deserve separate reviews.

We're also lucky enough to get an early look at Ubisoft's Assassin's Creed, which has us absolutely entranced, and spend some quality time with Fury.



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### Engine Room: Far Cry 2 70

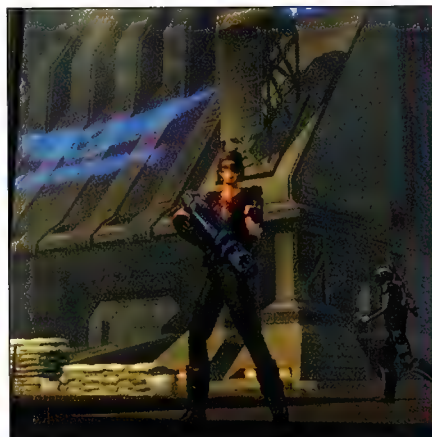
Take a close look at FC 2's African action with Logan Booker

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## Tabula Rasa

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Tabula Rasa is the latest game epic from revered Ultima creator Richard Garriot (who's also keen to get himself into orbit, just like his dad!). In this rich, sci-fi MMORPG you take on the role of brave defender of the Allied Free Sentients, in a staggering fight against extinction.



# The Crying Game

Logan Booker holds Ubisoft Montreal's Patrick Redding at gunpoint, and grills him for the tech specs on the developer's new title, Far Cry 2.

**I**t was supposed to be a tech demo for NVIDIA. A pretty and slick presentation on just how well the company's GPU could render polygons and paint textures. Depth, game play and story were not only lacklustre, but intentionally ignored, and the demo, known then as X-Isle, had no allusions to being a fully playable, or even fun, game. Developer Crytek had other plans, however. With the help of Ubisoft, Crytek built Far Cry into a beast of a title; a free-roaming and incredibly flexible game that rewarded exploration and challenged players to do whatever the heck

they wanted. Boats, buggies and hang-gliders featured widely, along with luscious water with the world's sexiest waves, and an island so packed with fresh vegetation that Don Burke tried unsuccessfully to feature the isolated retreat on his show (we're guessing he failed due to language barriers or errant machinegun fire).

While Crytek has carried on with EA to do Crysis, Ubisoft stuck with the license and gave it over lovingly to its prized studio in Montreal. Now, with a few months of development time under its belt, Far Cry 2 is not only stunning, but innovative and evolutionary. So much so, it might even eclipse its step-brother over at Crytek...

## Your mission

Patrick Redding, Far Cry 2's narrative designer, was more than happy to answer our questions on the title. Our first query, as you'd expect, was concerned with the plot. Would Jack Carver be making an appearance?

"The player will not be playing Jack Carver," says Redding. "Instead he selects his avatar from nine possible characters, the remainder of whom appear later throughout the game as the player's buddies."

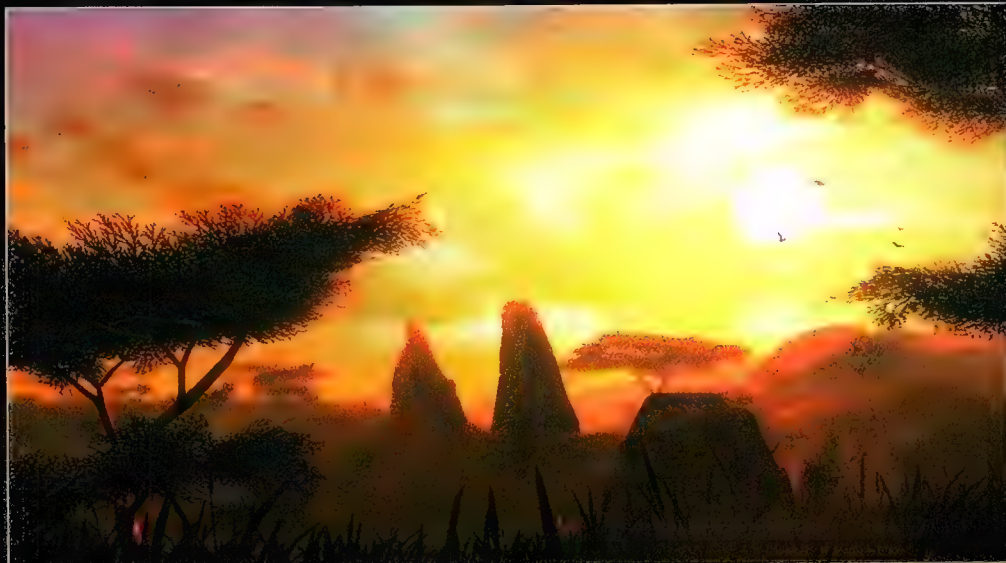
So, what's the story if Carver's been axed?

"In Far Cry 2, the player starts the game having already been dispatched to a failed state somewhere in Africa, assigned to track down and eliminate an infamous arms dealer. The country is in a state of lawless anarchy, with all the power in the hands of two warlords and their armed militia, backed by foreign mercenaries. In order to track down his target, the player is forced to make deals and take on jobs for these warlords that are too dirty for their own soldiers," explains Redding.

Yes, Far Cry is not set on an island, another point that differentiates it from the previous game, as well as Crysis. Ubisoft Montreal had to find another wide open space that

Top Has killing things ever been this pretty? Below Far Cry 2 boasts vistas so realistic you need a visa just to look at them!





a variety of exploration missions and side-quests, each of which rewards the player with valuable resources that significantly enhance his chances of survival. At the mid to low-level, all of the individual missions and objectives can be tackled in a variety of ways, from any direction. Players who learn to use the environment to their advantage will be at a tactical advantage."

## All about Dunia

Using the environment to your advantage, eh? So what does that mean exactly? For all we know, it's ducking behind a box to avoid fire, or using the corner of a building to fool the fallible AI into thinking you've vanished into thin air.

No – in Far Cry 2, the environment is alive. It does everything an environment should do, the most important thing being that it reacts to you and your enemies. This amazing development is thanks to Dunia, the engine behind the game. Redding says that it's about 90 per cent new

would offer the developer plenty of opportunities to inject verisimilitude into the new world it was creating.

The location of Africa has allowed Ubisoft to retain the open-endedness of the original without fear of repeating itself. Redding says that the player will be free to not only explore the world, but take on side-quests and scavenge resources. The fact that there's multiple missions, instead of just one, should in itself provide loads of replayability, freedom and perhaps even downloadable content after release.

"Through his actions, the player will determine the course of events in the game's world, including the fate of its dominant factions and their leadership, as well as that of his own allies," says Redding.

"In addition, the open-world structure of the game supports

**Top** There's more to Far Cry 2 than just jungle...  
**Below** Player actions can change the course of the game. This guy was going to become a Nobel winning author in a year. Not now!





technology, with the rest coming from the remnants of the first CryENGINE. This heavy rewrite was to aid support of Direct3D 10, though the engine is still very capable under the older D3D 9.

"Our engine supports a lot of new features that make the environment, characters, AI, and animation realistic and believable for better immersion. We are able to create a fully open world that's 50km square; with dynamic and destructible vegetation. Our engine also allows us to have a 24 hour day-night cycle (with fully dynamic lighting)."

That's impressive Patrick, but we're guessing there's a lot more to it.

"We have a procedural sky rendering system that allows us to manipulate the weather according to our wish and the sky adapts. We have new fire technology with a realistic propagation system, so basically everything that looks like it can burn, will."

Whoa, what? Propagating fire? There's not an FPS on the market today that does that. SimCity did an okay job back in the day, but it wasn't an FPS and it didn't have access to the tech we have now.

The video clips that have been released for the game show this wonderful feature in action. A gas tank explodes and sets a tree on fire. As the flames devour the dried, white



branches and lick hungrily at the sky, it's suddenly attacking the surrounding grass. Before you know it, the conflagration has spread to other bushes and plants, leaving parched, black land in its wake. And, not only does it look awesome, you can use it to set enemies on fire and destroy vehicles.

Finally, the environment can play a bigger role in the player's strategies.

According to art director Alex Amancio in his developer blog, all this is generated procedurally; that is, dynamically. No scripting, no pre-generated lies, just sweet and incredibly complex mathematics. Or magic. One of those.

And it's not just fire. Amancio says that clouds will form and break up of their own free will; a special system called RealTree will allow thousands of individual plants to be displayed at once, all able to react to the movement of the player and enemies, as well as bullets and other hazards; and the wind will be able to pick up leaves and toss them around, as well as bend and break branches.

Top Weapons will get notched and dirty like never before. Below Realistic filth-on-face technology. All the modern games are doing it.





It all looks so deceptively peaceful...

## I'm hit!

Keeping with the realism theme, Ubisoft Montreal has developed a fascinating 'wounds' system to simulate real combat, while not tampering too much with the fast pace of the game.

Clint Hocking, the game's creative director, explains that while the player will be able to take the odd bullet here and there, if they take too much damage too quickly, you'll have to deal with it behind the safety of cover. When the player presses the key to address their wound, the game will detect what sort of damage has been done, and throw out a special wound animation from a library of 60. So if you're on fire, you'll pat yourself out, while being shot will require you to pull a bullet out.

Hocking also says that damage is split into three states: 'okay', 'not so good' and 'you're going to die'. You can get by if you're not so good, but if an injury throws you into the 'you're going to die' category, you'll need to take care of yourself as soon as possible, or face the consequences.

Finally, Ubisoft Montreal has gone to a great deal of trouble to make the objects in the world as reactive as possible. This is achieved by manipulating vertex shaders. The engine is capable of real-time deformation, simply by 'brushing' different colours over the heightmap, saving space and time on creating individual models or animation states for destroyed objects. It also allows destruction to happen dynamically, so no two smashed jeeps will look the same. For a single vehicle, the developer can store all this mapping information in 1-2MB using DXT1 compression.

The engine's flexibility extends to weapons as well, so a machete can appear new and clean one moment and then, with a quick flick of the fingers from Dunia, be dynamically scratched and bloodied the next.

## Off to Africa

It seems almost criminal that we'll have to wait until the second quarter of 2008 for Far Cry 2 to arrive. All signs point to a killer title, one that could usurp the spotlight from EA's Crysis. Here's hoping Ubisoft is willing to open up on licensing so other developers can make use of Dunia's startling technology.

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# Team Fortress 2

David Hollingworth spins up his minigun and wades into the fray.

**W**e debated just how to cover the recent release of Valve's long-awaited Orange Box. Review it as one product? Look at each game alone? Ignore the review and just get lost in the sheer value of the Box? While the latter was easily the most tempting option, we manned up and decided that these were games so good, they deserved standalone attention. And sweet monkey Jesus, Team Fortress 2 is one fun, fast, and visually stunning game.

TF2 has an impressive pedigree. It was one of the first big mods for Quake, released back in 1996 and put together by three keen Aussies who later worked with Valve to release Team Fortress Classic for the Half Life engine. It was a huge success, and Valve soon made plans for a bigger, better and grittier release in the shape of Team Fortress 2; which soon became known as one of the biggest pieces of gaming vapour-ware the world had known. Until now.

The new iteration of TF2 is radically different from any previous version or ideal. All pretense of 'simulation' is thrown out the window in favour of insane physics, old school fragging and Incredibles-esque character design.

Visually, TF2 owes more to games like Lucasarts' venerable Monkey Island series, with exaggerated

cartoon figures dashing across a brightly coloured landscape, rather than, say, the gritty look and feel of Half Life 2 or other team-based shooters like Enemy Territory: Quake Wars (reviewed last issue). The hulking Heavy is the perfect example of TF2's design ethos – tiny legs support a huge barrel chest, topped off by a blunt, bullet-like head; and his weapon is a ludicrously large mini-gun on steroids. His voice is a thick Russian caricature that booms across the map, instantly warning the enemy that hot-lead death is about to rain down on their position.


This leads into another of TF2's strong points. Each character class, and there are nine of them, is perfectly unique from both a design and gameplay perspective. Run-speed, firepower, health, and area damage abilities are all traded off each other to make picking the best class for a given map and team an ongoing exercise in never-quite reached perfection. Going back to the Heavy, no other class can match him for hit points or sustained firepower, but he's also the slowest class, and completely lacks any kind of pin point accuracy; but supported by a Medic, and flanked by a Demoman and a Soldier, and you start to see how all these unique classes are designed to interact.



**Left:** All nine of the TF2's classes is a unique creation. **Above:** Little man, little gun; big man, big gun!

If there's any flaw in the game, it's the limited amount of maps included with the initial release. There are only six; given the speed of some games, you'll find most servers will rotate back to the same maps frequently in any sufficiently long gaming session. But to our mind, this is a very clever move. With nine classes to explore and co-ordinate, TF2 offers not variety of locale, but variety of strategy, which is a true rarity in this kind of FPS. In one particularly long attempt to win on the venerable 2Fort, for instance, strategy can shift from using stealthed Spies to infiltrate the enemy base, to converted rushes of teamed Medics and Soldiers. Similarly, defensive measures can sway between Heavies and Snipers stopping assaults dead, to planned ambushes that combine charges from a Demoman and automated turrets put in place by Engineers. Given time there'll be even more involved strategies created, and more insane ways to counter them.

Steam's new Community features also feature in the game's longevity. Nearly every session at the keyboard will unlock new achievements, or at least tell you how close you've come to beating your old high score, damage output or time spent alive.

Even if you don't want to get the entire Orange Box, TF2 can be purchased separately via Steam – and any FPS fan with a sense of humour and an itchy trigger finger will find this a must-own. 



PC

Developer Valve  
Publisher Valve  
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Recommended  
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## VERDICT

Fast paced action;  
Unique character design;  
Just plain fun



Only six maps; design style  
may not suit all gamers;  
Took too long to come out!



SCORE

9.0  
OUT OF 10

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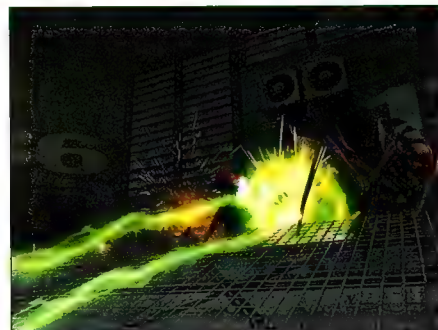


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# GIGABYTE™



**Above:** A very tense fight between man and bug.  
**Left:** The Hunter, a nasty new enemy to deal with.

# Half Life 2 Episode 2

The Freeman is back, polishing his horn-rimmed glasses and kicking arse. David Hollingworth's just along for the ride.

Valve originally intended for the Half Life 2 Episodes to be a lot more regular; extensions of the original rather than discrete expansions. Episode 1 was universally hailed as a unique step forward, both a great game and a perfect example of what the Steam distribution platform was capable of delivering to gamers. Unfortunately, there was a much longer than anticipated wait for Episode 2. Has it been worth it?

Oh hell yeah.

The new addition to the Half Life mythos begins where the last one ended – in a pile of wrecked metal following the aftermath of the mother of all explosions. You're soon dug out by the ever-capable Alyx Vance, and not long after that you're hip deep in trouble. Where Episode 1 was all about the claustrophobic halls and streets of City 17, this one starts off in near idyllic countryside, then takes you into an ant-lion (and worse)

infected mine. The story moves along at a pretty fast clip, and it would be cruel to give away any of the bigger plot points; suffice to say this story has everything. Bad things happen to good characters, long-asked questions are answered, and even more mysteries are discovered.

If Episode 1 was a continuation of the series, Episode 2 really has more of a classic expansion feel to it. There are two new enemies to learn to fight and dispatch, and it's a testament to Valve's excellent design that they are truly new challenges. The Antlion Worker is a nimble, acid-spitting bug that you'll really learn to hate; the Hunter, on the other hand, is a new synth (like the various flyers and the Strider) is an almost likeable enemy. It's fast and scary, and bigger than you, but like all the synths it's very reactive to wounds, and kind of cute. Well, we think the synths are kind of cute, anyway. It also features a great flechette weapon that clever players can use against it. Great design.

The other big new addition is the Hot-rod, a vehicle that will be any hoon's delight. It's not armed, like the original Half Life 2 buggy, but it is fast, and it's upgraded with some neat toys as the game progresses, each of which also add another gameplay layer.

The game has advanced graphically, as well. This updated version of the Source engine features an enhanced lighting system that allows for dynamic shadows cast by Gordon's flashlight and

self shadowing of certain items. Alpha-to-covering rendering helps with foliage in the large outdoor areas, while the physics system has been beefed up. This is particularly noticeable when a wave of Striders starts chewing up the scenery with their world bending cannon.

We've said it before, but we'll say it again – the Source engine is still major contender.

What's most interesting about Episode 2 though is that when you get down to it, it's really not the best game in the Orange Box. Team Fortress 2 pushes more graphic design boundaries, while Portal, which Aston Mills waxes lyrical about in this month's Technica Obscura, redefines both the physics and story-telling of gaming. Episode Two is almost quaintly old fashioned in comparison, and if you're not a Half Life fan to begin with, this isn't about to win you over.

This, however, is not a bad thing, and Episode Two really is a great addition to one of the best franchises in gaming today. It's a great FPS, with likeable characters, excellent story and design, and backed up by solid engine. The fact that you get two more great games in the Orange Box is simply more reason to make it a must buy for any gamer worth their salt.



Developer Valve  
Publisher Valve  
Website [www.whatistheorangebox.com](http://www.whatistheorangebox.com)

Recommended  
Intel Core 2 Duo; NVIDIA 7600  
or ATI x1600 256MB; 1GB RAM

## VERDICT

New enemies; advances the Half Life universe; incredibly tight gameplay



No new weapons (kinda -ed); Poison Headcrabs still scare us silly



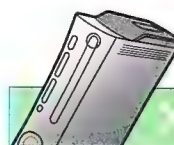
SCORE  
**8.5**  
OUT OF 10



We cannot overstate how pretty this game is. Expect to see HD TV sales seriously boosted by this game's release.

every tower you see – not only is there a good gameplay reason to, but from the highest buildings you'll have a view that almost rivals the real thing.

There's a rumour that one of the devs found the best travel routes, and the most convenient tactics, to finish the game in eight hours. That's kinda neat (and must be great to watch), but we really recommend you take your time with Assassin's Creed. It's worth it, and, after all – that's what a good assassin should do.



Developer **Ubisoft Montreal**  
Publisher **Ubisoft**  
Website <http://assassinscreed.uk.ubi.com/experience/>

Players **One**  
Other platforms **PC, PS3, PSP**

## VERDICT

Unique control scheme;  
excellent historical  
accuracy; free-running



Can take some getting used to;  
Altaïr's voice acting is not ideal;  
broke our legs free-running



SCORE **9.5**  
OUT OF **10**

# Assassin's Creed

The life of an assassin is full of danger and excitement. And a lot of running, apparently.

**A**ssassin's Creed takes you back in time to the Holy Land, and the the Crusades to reclaim them in the name of Christianity. It's a telling sign of the game's maturity that it opens with a statement that the developers and creators of the game come from many countries and many faiths, and that this game is not to be taken as any kind of political commentary.

That maturity is there at almost every level of the game. The story is, well, we don't want to give too much away about that, but rest assured it's a suitably complex morality tale that sees you take on the roll of an assassin a mysterious order of Middle Eastern killers, and not necessarily for hire.

Look at it this way. Any game that has "Nothing is true; everything is permitted" as part of its dialogue is something to be taken seriously.

And if that doesn't get you, the gameplay, once you get used to it, will have you hooked.

Assassin's Creed does away with many of the conventions of the third person action genre. No

longer are you running along perilous ledges trying to time your jumps juuust right, or fall to your doom; rather, jumping, and many other of the game's actions, are state-dependent. Run at a ledge, with the jump key held and you automatically leap gracefully into the air, grabbing the nearest ledge or simply taking the drop in stride. Keep that key held on firm ground and you sprint; sprint at a wall with any kind of rough surface or handhold, and you can free-run all over the rooftops, window ledges and church spires of any of three gorgeously rendered Crusader cities.

There's bit of a learning curve, but once you get used to this, and the camera movements, your dexterity ramps up and the claustrophobic city streets seem like expansive highways to Arabian adventure.

The joy of this is the fact that the game stops, to an extent, being about twitch reflexes and constant saves and reloads, and becomes a far more cerebral exercise where what you decide to do, and how you want to do it, is more important than how quickly you can mash the appropriate button. Combat follows this doctrine as well, and the simple controls, like any good game, quickly reveal a subtle and deep complexity.

As good as the game plays, it would be a waste if the world you were leaping about didn't look worth exploring. Thankfully, the Kingdom looks stunning, and Ubisoft Montreal has done an exceptional job recreating the period. Each city is a bustling metropolis populated by priests, scholars, knights, merchants and more. The sounds of the street are wonderfully atmospheric, and the decision to have accents from all over Europe and the Middle East adds oodles to the sense of historical immersion.

Each city is built up of Lego-like building blocks, which might lead to some visual repetition; in practice, however, you're moving too fast, or are simply too high up to really notice. Trust me, climb



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# Fury

James Matson is out to steal your essence.

PvP (Player-versus-Player) combat has always been dicey in MMORPGs. Most – like World Of Warcraft – feature a world designed around players fighting AI instead of each other, with PvP play bolted on around that framework. The result is an experience where handfuls of character types and item combinations obliterate the competition.

Auran has stripped away everything except the combative core with Fury in the hopes of providing a competitive PvP arena where everyone gets a fair chance to burn others to a cinder with fiery death. The storyline is unobtrusive; as an immortal warrior protecting your realm (translating to the server you're on) against the onset of a corrosive energy known as the Fade, you throw yourself into combat against other immortals for the prize of Essence. Essence is what drives your character's advancement, and can be spent on abilities from any one of the four elemental schools of magic.

In a touch of brilliance Fury does away with static character classes. The archetype you choose during the tutorial stages – from one of the eight available – can be played open and mixed up to your hearts content by spending Essence gained through combat on spells and abilities from any school of magic you want. Healers may start aligned with Water and Air, but can easily pick up offensive spells from the school of Fire. It's a freeform design that provides scope for tailoring characters to suit particular fighting styles.

Remodeling another fantasy staple – finite pools of mana or energy – Fury instead uses a system of 'charges' aligned with the schools of magic. Some

abilities generate charges as a secondary effect while others consume them, creating a need to balance your charge expenditure on the battlefield. The constant charge juggling can give combat a clunky feel, but persevere and you'll start enjoying the extra strategic layer.

Three different game modes are on offer – Bloodbath, Elimination and Vortex – which you can access by speaking to a warmaster NPC in the game's one non-instanced area, the Sancturum. These arenas are where the fast-paced action takes place, featuring anywhere from 16 to 32 players pitted against each other on maps littered with tide altering power-ups. Bloodbath is pure death match, with Elimination its team-based companion; Vortex is the Fury twist on capture the flag. At the end of combat, you're awarded not only Essence, but the chance to roll on an assortment of enchanted armour and weapons.

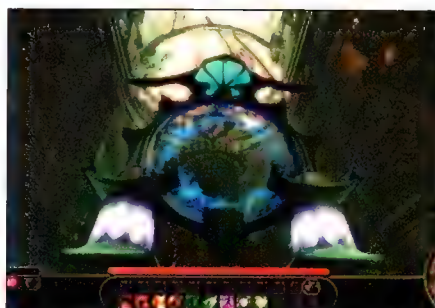
Additional game modes would have been nice, but what's available is propped up by diverse maps rendered to perfection on the Unreal 3 engine. There's an option to switch to low-end DirectX 9.0 rendering for those with older hardware, but it's filthy to look at. If you're only finding acceptable frame rates with this option on, upgrade your hardware – pronto.

On the flipside, character modeling and animation is disappointingly expressionless. Equally disappointing is the sound; the music is absorbing, but Fury's sound effects are lacking.

While free to play, you can pay monthly subscription fees for priority placement in login



▲ The fantasy genre; incomplete without glowing blue orbs of power.



▲ High end DX9 (left) versus low end DX9 (right). Startling.

queues and additional rolls on items, but for a game that prides itself on suiting the casual rather than hardcore gamer, the value is questionable.

Fast paced and pioneering, Fury is ultimately a mixed bag. Poor character models, lack of ability to queue for more than one warzone type simultaneously, and few game modes to choose from all chip away at what is an otherwise fantastic PVP innovation.



Developer Auran  
Publisher Auran / Gamecock  
Website [www.unleashthefury.com](http://www.unleashthefury.com)

Recommended  
Intel Core 2 Duo; NVIDIA 7600 or  
ATI x1600 256MB; 1GB RAM

## VERDICT

New take on PVP; Stunning environments; fast paced



Drab sounds; lifeless avatars; lack of game modes



SCORE

7.5  
OUT OF 10

DIRECTED BY  
YOSHIAKI KAWAJIRI,  
CREATOR OF  
NINJA SCROLL &  
ANIMATRIX: PROGRAM

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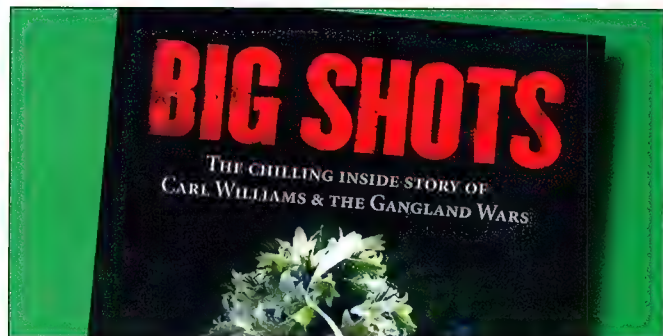
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# CULTURESHOCK

Everything you need to know about geek film, music and literature.



## Big Shots

**BOOK** Author Adam Shand  
Publisher Penguin

In the early 00s, Melbourne was known more for its gangland slayings than its coffee. For a good while, the war in the underworld dominated the morning newspapers and evening news bulletins. And finance journalist Adam Shand was right in the middle of it.

This isn't your usual true crime book; Shand makes his presence known, writing in first person about his interactions with figures such as Carl Williams and Mick Gatto, his troubles with the police and his initial inability to understand what was going on in the streets of his hometown. At the beginning of the narrative, Shand is clearly naive. It's a wonder he didn't get shot or beaten – indeed, as this book reveals, at several points he easily could have been.

When it comes to books on Melbourne's underworld, *Big Shots* would have to be one of the most credible. Shand met a lot of the players on both sides of the war and the law. He consulted, too, with such notorious figures as former police officer Brian 'Skull' Murphy, Mark 'Chopper' Read and Katherine Pettingill.

*Big Shots* is by no means a flawless book. The early narrative is a little jittery, and Shand mentions maybe one too many times that yeah, the police are keeping an eye on him too, seeing as he's constantly on the phone with Carl Williams. But on the whole, we must award it our stamp of approval. Shand offers a unique and welcome perspective on that crazy period in Melbourne's history. **CT**

score **8.0**  
OUT OF 10

## Innocent Voices

**DVD** Distributor Madman Director Luis Mandoki  
Starring Leonor Varela, Carlos Padilla

*Innocent Voices* would no doubt appeal to those who liked the 2004 Chilean film *Machuca*. Based on the experiences of screenwriter Oscar Torres, it depicts the events of the Salvadoran Civil War from the perspective of a young boy. *Voices* is far slower than *Machuca* was, but by no means is it any less powerful. In further contrast to *Machuca*, the tone of *Voices* is much more consistently sombre.

Technically, *Voices* is a brilliant work of cinema. Some of the scenes – most notably the opening, where soldiers are marching a group of boys, the central character among them, through the forest – are so very memorable. The camerawork is subtle but wonderful. *Voices* doesn't have the rollicking soundtrack of *Machuca*, but really, that's an issue of tone.

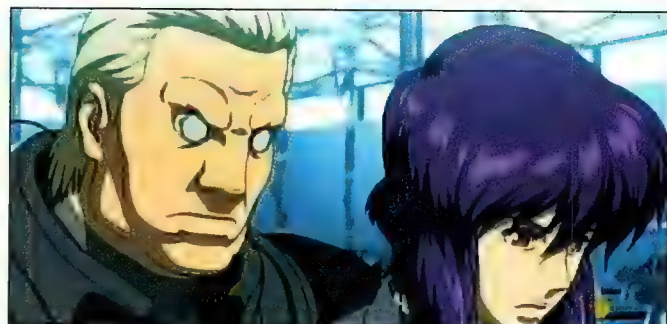
It's depressing as hell, of course. If you're after the sort of film that starts off grim but has a hopeful conclusion, you're probably better off looking elsewhere. Both Torres and director Luis Mandoki have an agenda with *Voices*, one that is made abundantly clear over the two-hour runtime. Still, preachy as they can be at times, you'd have to be pretty cold to take issue with their campaign against the military use of kids – no matter how 'noble', 'honourable' or 'just' the cause.

*Voices* is by no means perfect; at times, it's probably a little too slow. And in no way does it have the same level of polish as *Machuca*. Still, it makes for an interesting – yet depressing – couple hours of viewing. Recommended. **CT**

score **7.5**  
OUT OF 10

## ANIME OF THE MONTH

Your regular dose of anime goodness courtesy of our resident expert Armina Soemino.



## Ghost in the Shell: S.A.C. Solid State Society

Studio Production I.G Web [www.madman.com.au](http://www.madman.com.au) Price \$34.95

Based on the *Ghost in the Shell: Stand Alone Complex* series rather than the original films, *GITS: Solid State Society* lacks that spiritual something its predecessors always managed to capture. The result is a more action-focused movie that's entertaining, if a little light philosophically.

Motoko Kusanagi is no longer a part of Section 9, the government branch responsible for dealing with cyber crimes. Agents Togusa and Batou prove our main protagonists, with Kusanagi making appearances from time to time to help the branch. SAC focuses on the machinations of the mysterious Puppet Master, who appears to be forcing people to commit suicide, and orchestrating the abductions of – apparently – thousands of children. As expected, there's more to the Puppet Master's puppetry than what is on the surface, and what looks like an elaborate plot eventually leads to a simple goal.

Definitely more for fans of SAC than the casual anime watcher. **AS**

score **8.0**  
OUT OF 10



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# TECHNIQUE

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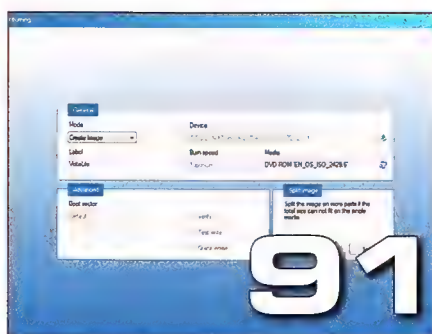
This month we continue to put together our super-super arcade cabinet, which is not only really starting to come together, but is also sending some members of the Atomic crew on a serious nostalgia trip. Oh, the afternoons some of us spent putting 20 cent coins (which is a dead giveaway, really) into these things and beating the tar out of beasts in Gauntlet!

If, however, you're not wanting to get dirty with the hardware, we've also got a handy guide to streamlining your very own Vista install – it takes minutes, not hours, and we can't recommend it highly enough.

Finally, we've got our new education section detailing what you'll get out of TAFE or Uni, and all your questions answered, in IO.



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## TECHNIQUE CONTENTS

### MAME box tutorial, pt2 86

Journey into a strange world of wood and metal and real tools, in our ongoing quest to make the perfect gaming accessory – a MAME-powered arcade cabinet. Ron Prouse has all the know-how.

### Streamline Vista 90

Logan Booker shows us how to cut the heart out of Windows Vista, and leave it a much leaner, easier to install beast, customised for you and on disc ready to roll.

### Input Ouput 93

Dan Rutter knows things that man was not meant to know! He also knows a lot about tech, computers, and other useful stuff.

### Atomic.edu 96

Choosing between a TAFE course and a similar course at a university can be tough. Christopher Taylor looks into what you can expect from both.

### Fallout 98

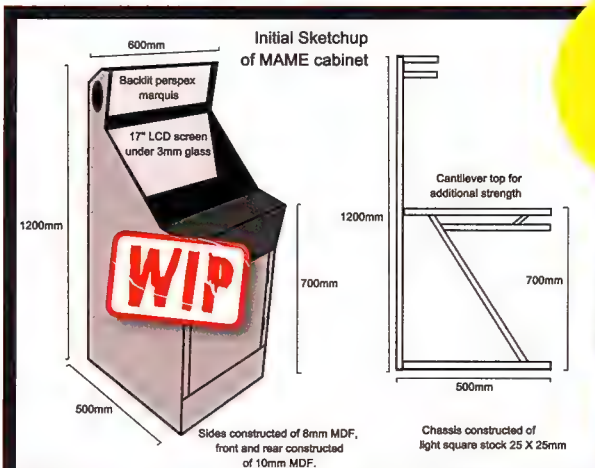
The best pics from Atomic LIVE 2007 – taken by Atomicans, of Atomicans.



**Doctor Who + Torchwood**  
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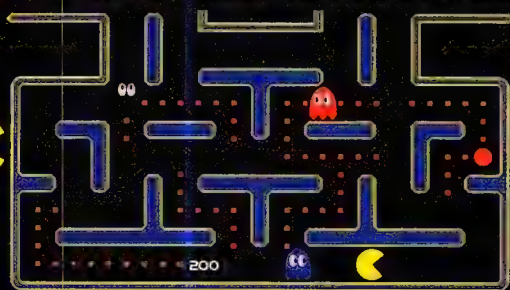
[www.atomicmpc.com.au/competitions](http://www.atomicmpc.com.au/competitions)

Doctor Who is probably the ultimate geek hero – he's a scientist, an explorer, a gadgeteer, and on top of that... he hangs out with some seriously hot companions. What's not to love? In fact one of those companions was so popular he got his own show, Torchwood. So if you're a fan of the Doctor and Captain Jack, this comp's a must.



## THE MISSION

Construct a PC case that resembles a classic arcade machine, and then install MAME onto its drive for some old-school gaming goodness. This is part one of a three-part tutorial.



## TOOLS

The tools used in this tutorial are mainly those found in the average workshop, including a router, circular saw, jigsaw, mitre box, drill press and drills, block plane, electric sander, G-clamps and a grinder. The important thing is to keep the structure 'square' and 'level', so a set-square, sliding bezel and a tape measure are critical items to get all of the angles perfectly symmetrical. The main requirement is a decent bench or table, providing a solid, flat surface to operate on.

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### Additional Hardware Supplies:

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- White Knight Multi-purpose MDF Undercoat/Sealer, \$14.95 Litre.
- Taubmans Easycoat Flat Black wall paint, \$23.95 Litre
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## DISCLAIMER

Whenever you pick up power tools, cutting and grinding instruments, or even a can of spray paint, you are putting your general wellbeing at risk from some form of industrial level accident. We take every precaution by wearing appropriate safety equipment, using tools with respect and within their limits, and by not inhaling the contents of glue and paint containers. We suggest that you should follow a similar regime, and seek professional assistance and guidance if you are attempting a task outside of your skill set.

NB. atomic MPC and staff are not responsible for your safety or longevity.

DIFFICULTY **HARD**



# MAME Tutorial part 2

Ron Prouse continues to take us through his nostalgia-filled arcade project, as we head deep into the build phase.

**A**t the end of Part 01 of this tutorial the mini-MAME cabinet was really taking shape, with all of the internal panels fitted and the new, improved build-plan scoped out; at least for the moment, but more about that later.

The next step is to prepare the panels for sealing and undercoating, and that means spending a couple of hours of quality time with a tub of filler and a half-sheet electric sander. Using a good quality paint scraper (flexible, high-carbon steel), all of the countersunk screw-holes, gaps and chips that will be visible were filled using Uni-Pro multi-purpose filler, sanded with 80 grit sandpaper, and then the process repeated ad nauseam until you have achieved a blemish-free surface. The best method is to 'over-fill' the holes and sand them back to level after the filler has properly cured, preferably overnight, as this will help overcome the 'shrinkage effect' that leaves a noticeable concave finish over the imperfection. Once the holes have been filled, all of the panels can be finished off with a fine grit paper to give an even surface texture for painting.

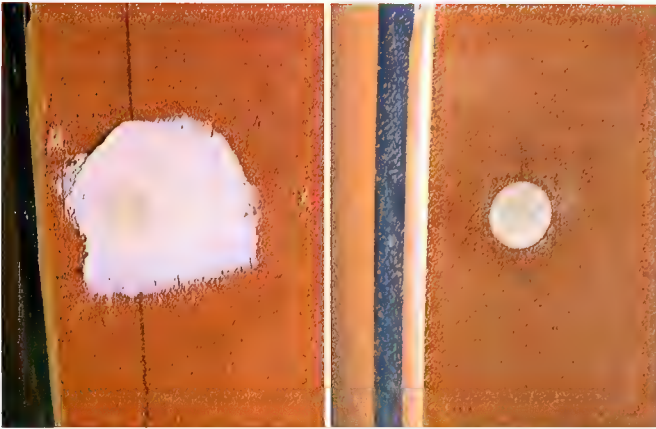
As we have pointed out before, don't be tempted to think that paint will hide poor surface prep; most times it will make it even more obvious.

## A lick of paint

The starting point is to seal the timber, and the best result is achieved using a task-specific MDF undercoat. I applied White Knight water-based primer; the hard to reach areas were brushed in first, and then the larger sections coated using a 70mm rag roller. The first coat was allowed to dry, and then lightly sanded before a second coat was applied. At this point any small outstanding imperfections can be tackled using spot putty, and additional undercoat applied.

The next step is to paint the screen surround and table-top with a non-reflective black finish, which will reduce glare around the screen. After some searching we found that Taubmans makes a fantastic flat black wall paint, which is even washable without creating shiny spots. This was also rolled-on

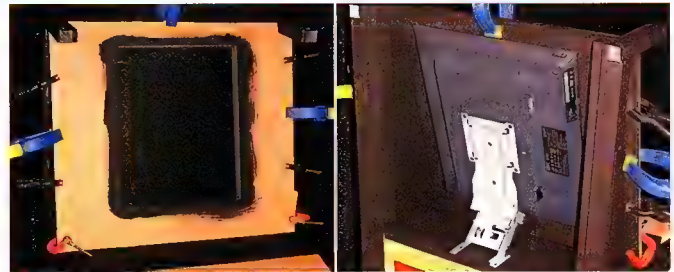
to achieve an even finish. Under no circumstance will a blackboard paint give a sustainable result, as it marks far too easily. I decided that the areas that were left in the white undercoat would be painted with a durable gloss enamel once a final colour scheme had been decided.



▲ 'Over-fill' the holes and sand them back to level after the filler has properly cured.

## The best laid plans

It was at this time that my plans were again thrown out through the workshop window! I've been playing with the MS-based MAME32 for ages on the communal PC, using a monitor in typical landscape orientation, and that was the hardware configuration that we had thoughtlessly planned for the cabinet – based purely on what we were used to. As will be outlined later, Chris Wigg at OzTick had been called upon to supply us with his 'standard' DOS-environment upright cabinet software, which included a configuration setting that expects the monitor be in portrait mode. The choice was to either change about 180 lines of the config.sys file, or rebuild the top section of the cabinet to re-orient the monitor. The latter may not be the obvious choice, but once we had realised just how much additional screen area was used in portrait mode it became a no-brainer decision. The majority of our favourite games



▲ Changing the cabinet to portrait-mode required some major surgery.

were now full-screen rather than surrounded with black sidebars. Of course, changing the cabinet required some major surgery, as the 'old' monitor mask opening was too wide and not deep enough for the portrait orientation, the internal timber supports were in the wrong spots, and the steel monitor bracket needed to be modified (with a large hammer...) and rotated 90°. These issues were resolved with extreme prejudice and a jigsaw, and once a new screen mask was cut out of 5mm thick MDF it was glued and screwed straight over the remnants of the previous one. This process took a few hours of back-tracking, but it resulted in a much better solution for future gaming enjoyment.

## Let there be...

The next part of the project was the light-box at the top of the screen, otherwise known as the 'marquis'. This is the one component that really makes an upright cabinet look like an authentic gaming machine, rather than just a box with a screen, however it also requires a bit of woodworking skill and a build-plan. Now, for this part we really did have one! The front fascia had a 12mm channel routed for the base to slot into, and the opening for the front glass was then cut out. This panel also has a 30mm overhang across the base, to help conceal the metal cabinet chassis and the speakers that will be fitted later.

The two sides are shaped with a 15° front-to-back downward taper, with 3mm wide, 6mm deep slots routed on the inner surface. These slots will locate a shelf where the backlight will be mounted centrally behind the glass. I cut the base to size, and two holes cut out to mount downward facing 100mm speakers. While the four sides were fabricated out of 12mm thick MDF, the rear cover was made from 5mm, and the shelf from 3mm. The box was assembled using PVA glue, small brads (nails), and then clamped together until set. Even though there was more to be done, the basic carcass was then filled, sanded and given a coat of MDF primer.

The next step may well be a contentious one, depending on your specific State laws, so it is here as information only and we suggest that you have a qualified electrician perform it for you. The hardware in our cabinet requires four power connections – PC, screen, amplifier and marquis lighting – so a four-way, hard wired, switched power socket was installed. Positioned on the left-hand-side of the centre-bracket of the chassis, a 40mm hole was drilled through the timber for the power lead to pass through from behind, and the switch block screwed on. The power lead and plug was a



▲ Sealing the timber, using a task-specific MDF undercoat.



▲ For safety's sake, consult a qualified electrician for all 240V work.



▲ The OzStick control buttons we're using can be ordered with various legends, and even 12V LED lighting.



▲ The controls required will be a direct reflection of the games you intend to play.

5m 240V extension lead, with the female end cut off and its wires stripped. This is the best solution we've found for this type of application, as it is a cheap source of 10A cable and the plug is already moulded neatly on to the end. The power cord was fed up from the underneath of the cabinet floor, through the chassis rails on the right-hand side, and across to the rear of the switch. Cable clips were then screwed to the inner skin with small PK screws, securing the power cord in place and preventing it from being dislodged during use.

## Getting it together

Finally, we are starting to assemble the actual hardware! The MAME cabinet hardware can be broken down into two distinctive groups – control functions and gameplay. The control buttons, such as player selection and coin-drop, can be placed basically anywhere that is convenient, and in this instance they are being situated on the right hand side of the tabletop, just in front of the screen - this panel was constructed from 16mm thick MDF. The OzStick control buttons we are using can be ordered with various legends (e.g. Player1, P2, etc.), and you even have the option of ordering them with various colours of 12V LED backlighting, which was our choice. The round control buttons are fitted with optional 6mm spacers, which in our opinion left them sitting too high. However, removing the spacers means that fitting becomes a little more involved. The P1/2 buttons will fit into a 27mm hole, but they're 'keyed' to stop them from turning; this can be easily overcome by cutting a slot into the timber with a small, round rat's-tail file.

The rectangular 'coin drop' button is a little trickier. Similar to the round buttons, a 6mm spacer is included so that the button can be fitted into a 25mm hole, but with the spacer removed (as shown) it requires a rectangular hole 48 X 29mm. After drilling a 25mm hole right through the panel, the dimensions of the rectangle were drawn in and a 12mm wood

chisel used to cut down two millimetres into the timber around the perimeter. The chisel can then be used to gradually carve out the hole down to the required depth. By going the extra step with these buttons, they sit close to the panel surface and achieve a much sleeker look.

The next step is to fabricate the control panel, and this is an area that has a million permutations – and I'm certainly not going to cover all of them! The gameplay controls that you require will be a direct reflection of the games that you intend to play, and in our case that is a very basic layout that will allow for all of the old, 'original' arcade titles such as Dig Dug, Burger Time, Bomb Jack and Galaga. After all, this machine will be used as a party fun piece, not a hardcore gaming experience. So, a joystick and three buttons will do just fine for now, and there is always room for later expansion by simply replacing this 55 X 22cm panel.

Firstly, the panel was cut out of 16mm thick MDF, shaped and undercoated. The three button positions were marked to grid in a slight ergonomic curve, and 3mm pilot holes drilled before using Irwin Speedbor® spade-bits to bore the 25mm holes. The pilot holes will help to keep the larger bit from wandering and creating elliptical holes.

The same process was followed with the joystick, which is screwed to the control panel from underneath. Once all of the drilling was complete, and the holes de-burred and sanded smooth with a 30mm flap-wheel, the final step was to apply the textured black vinyl overlay. Starting at one end, leaving plenty of overlap to wrap around the sides and underneath, the overlay was stretched and smoothed out over the length of the panel, and then wrapped over the edges. The corners were folded and trimmed, the holes cut out with a scalpel and the buttons fitted before fitting the panel back on the chassis. This stuff is amazing, with a silky-smooth feel that really adds to the playing experience!



▲ All genuine last century components, apart from a new IDE hard drive and power supply.



▲ An authentic arcade experience requires the cheesy arcade sounds and backing tracks of the original game.

## On the case

The top section of the modded PC case was fitted with an AC Ryan Meshx™ panel, which would have a positive effect on EMF radiation, but was really just added to protect the components and add some pizzazz to the final look.

As for the hardware that we're using, it doesn't get any more old skool than this; a Gigabyte 6BX-C Slot1 motherboard, 850MHz P3 processor with Thermaltake Golden Orb HSF, 384MB of PC133 RAM, TNT M64 AGP graphics and an ISA SoundBlaster sound-card! All genuine last century components, and perfect for the DOS 7 environment we'll be using. Even more amazing is that this set-up will run about 90 per cent of our games at 100 per cent frame rate. Another piece of handy advice from Chris Wigg was not to spend more on a video card than you need to, "as MAME does not use any of the 3D functionality that a video card may offer. If anything, consider an old 7000 or early 9000 series ATI card, as it's a little appreciated fact that the ATI cards handle 2D acceleration very well – an important factor if you want to play some of the 'hungrier' games". The only contemporary components that we used, for the sake of reliability, were a new Western Digital 80GB IDE hard drive and an Antec Phantom 350W fan-less power supply.

With the PC case in position, the next addition was a shelf to house the other components. Two sections of 29 X 42mm timber were cut to length and glued and screwed to the inner skin 100 mm above the PC, to be used as mounting points for the sliding shelf brackets that came with the original desk hardware. This made them the same width as the rear of the chassis when fitted, a very positive attribute as the shelf was designed to slide out through the opening! The shelf itself was fabricated out of 16mm MDF sheet, and then sealed with varnish. Meanwhile, the inside of the box was given two coats of white sealer, mainly to give it a more 'shop bought' look.



▲ Good cooling attributes are a must, regardless of the application.

## Bleep bloop bleep

The shelf will house the most important piece of MAME-specific hardware, the I-PAC2 encoder. The I-PAC translates defined controller commands into 'keystrokes' that the PC understands, either those of a default set, or user-assigned, and feeds them in to the PC via PS2 or USB connection. The I-PAC mounting points were copied onto the shelf, 3mm holes drilled, and nylon stand-offs screwed on from behind. The I-PAC was then attached to the stand-offs.

One of the other important factors in an authentic arcade immersion is to replicate the cheesy arcade sounds and backing tracks of the original experience. As mentioned previously, an ISA SoundBlaster card was installed, and then fed into a Jaycar Digitech 18W, 4 Ohm amplifier - the 4 Ohm specification was important, as it meant that we could use compact, but punchy, car audio speakers. After removing the outer casing for cooling purposes, the amp was attached to the shelf with 3mm screws.

One of the great things about a box this big is that adding cooling solutions is really simple. The rear air vent is an aluminium Harron Eave Air Intake Vent, which measures 400 X 200mm – roughly the same size as the PC case now that it has been cut down – and it even has a built in filter.

The final step for this second part of the tutorial is to add some colour to

the inner panels. The lower section of the 'body' was covered with brushed aluminium, making it a hardwearing kick-plate, and then the other panels and the marquis were given two coats of Solver Oil Based Silver to give them an aluminium appearance. Once completely dry they were given a coat of Solver Brite Glo UV, which will stop the paint from 'dulling off' over time.

The only problem with a three part tutorial is that, like any trilogy, Part Two isn't the beginning, and it's far from the end.

In the final instalment we will be wiring up the hardware, controllers, I-PAC and speakers, fitting the screen and marquis glass, adding some fans and lighting, cutting and fitting the external panels, fitting the T-moulding and walking through the software. There is still plenty to look forward to!



▲ It might look nearly finished, but there's still plenty to look forward to!

## OUR MISSION

The install DVD to Windows Vista weighs in at a hefty 2.52GB. That's way too big for an operating system, especially one destined to run on an Atom's box. This month, we're going to cull the lard from a Windows Vista Ultimate x86 image, slip in some updates and do a bit of tweaking, to create a super thin install DVD that's only 900MB... or even smaller, depending on what you really want. NB. atomic MPC and staff are not responsible for your safety or longevity.

DIFFICULTY EASY

# Create a streamlined Vista install

Logan Booker thinks Vista looks fat in that dress.

Ever since the release of Windows Vista at the start of this year, we've been dealing with one inevitable truth: The OS upgrade is coming. Try as you might to hang on to the almost perfect loveliness of Windows XP, or even 2000, Vista will eventually offer too much, especially to gamers, to resist.

That doesn't mean you have to do it Microsoft's way, however. We're going to show you how you can strip the unneeded bits from Vista, leaving only the tastiest components to be installed.

## Preparing

This is probably obvious, but you're going to need a legitimate copy of Windows Vista with a valid product key. It doesn't matter which flavour of Vista you have, but we'll be using Ultimate for the purposes of this tutorial. We also need to download a few things:

**vLite**, [www.vlite.net](http://www.vlite.net): vLite is a wonderful utility that gives us the ability to remove chunks from the Vista install, tweak certain aspects of the OS, and create an unattended install. It's not that complicated to use, but it does have a few quirks that can slow you down if you haven't used it before.

**Vista Update Pack 1.0.3**, [www.electrogen.signetsoftware.com/Vista\\_Update\\_Pack\\_V1.0.3.rar](http://www.electrogen.signetsoftware.com/Vista_Update_Pack_V1.0.3.rar): There's a number of ways to get your hands on the

latest updates, but this is by far the fastest. Contained in the aforementioned RAR is a bunch of hotfixes and patches released for Vista over the last year. There's a few newer ones missing, but the most important two, KB938194 and KB938979, are included. See the 'Vista Reliability Packs' boxout for more information.

Now, install vLite. There's not much to it: just point it to a directory on your hard drive and let it extract. Before we run it however, we need to do the following:

1. Insert your Vista DVD into your PC, and copy the contents across to a temporary directory. You may want to create a backup of this temp folder somewhere, to save you from having to recopy the Vista install files if you screw up. It's about 2.5GB worth of data.

2. Open the Vista\_Update\_Pack\_V1.0.3.rar archive, and find the directories 'Extracted' and 'x86'. Both can be found in the Updates folder of the RAR. Decompress them to another temporary directory.

That's it! Now find vLite on your desktop or Start menu, and start it up.

## Venturing into vLite

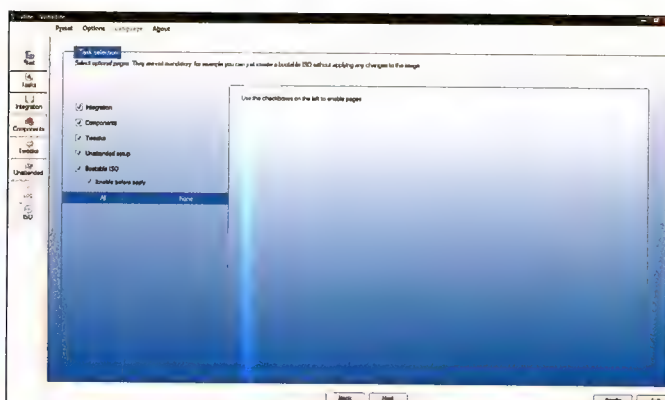
The first thing vLite will prompt you to do is install a WIM Filter. The WIM filter allows vLite to access the special image file that contains all the Vista installs. Without it, we won't be able to create a slipstreamed image, so say yes when asked to install it. Thankfully, you won't need to reboot for this.

Once this dialog box is gone, you'll see a drop-down box in the middle of the vLite window. Hit the browse button to the right of it and locate the directory where you copied the contents of the Vista DVD. vLite should analyse the folder, and then prompt you to select a flavour of the OS. As mentioned previously, we're going to use Ultimate, but choose whichever one you have a valid key for. Hit the Next button.

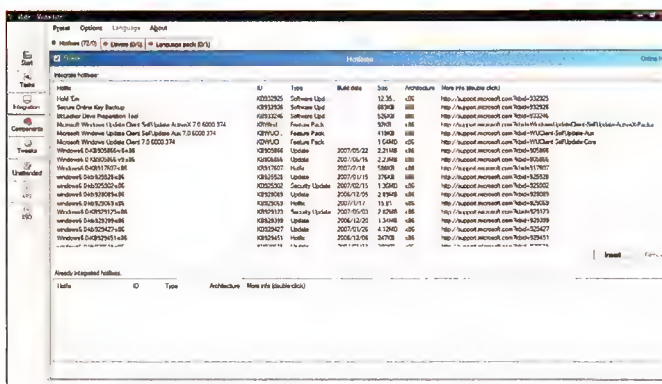
Now we need to configure what we want to play with. Unless you're the



▲ Let vLite know where your Vista install files are.



▲ We want it all!



## ▲ Integrate all those fantastic updates into your install.

timid type, tick all the boxes, which will include:

- Integration
- Components
- Tweaks
- Unattended Setup
- Bootable ISO
- Enable Before Apply

'Enable Before Apply' is particularly important, as you won't be able to create a bootable ISO otherwise.

The next page allows us to integrate language and driver packs into the install, and is one of the most powerful features of vLite. We're not going to worry about language packs, as Vista comes with English, and we're also going to give driver integration a miss, as the last thing you want in your clean install is redundant drivers if you ever decide to replace your hardware. Best to keep the install as light as possible.

With hotfixes, however, we're going to go all out. In the Hotfixes tab, hit the 'Enable' checkbox, then click the Insert button. First, browse to the 'Extracted' folder we decompressed earlier, select all the updates you find there, and hit Open. vLite will automatically import them, and they should appear in the list box. Now follow the same procedure for the 'x86' directory.

We're finished with this page, so we'll hit next to get to the really good stuff – content removal.

## Out with it!

Removing unwanted components from Vista has many benefits. It reduces the size of the image, increases the speed of installation, and reduces the amount of space taken up by the final install. A word of warning, though – when vLite removes a component, it's gone. Vista will consider it to have never existed, so trying to run or patch a missing component will result in an error. There's also no way of adding back in a missing component, short of a fresh install.

Before you can hack anything out, vLite will provide you with several 'compatibility' options. Essentially, these checkboxes prevent you from inadvertently removing support for components you need. Feel free to select what's relevant to you, but here's our recommendation:

- Aero Glass
- Internet Explorer
- Windows Performance Index

Now, what components to remove? Here's our list of things you can get rid of. If for some reason you need something, then by all means keep it, but most of the time you're not going to miss any of these.

### Accessories

Accessibility  
Mobility Center  
Welcome Center  
Sidebar and Gadgets

### Drivers

Modem  
Printers  
Scanners

### Games

Inbox Games  
Premium Inbox Games  
*Don't remove Game Explorer - some newer games require it*

### Hardware Support

Windows Image Acquisition  
Windows Mobile Device Center  
Windows Portable Devices

### Smartcards

### Languages

Korean  
Japanese  
Simplified and Traditional Chinese

### Multimedia

Media Center  
Movie and DVD maker

atemic



## High-performance memory for gamers.

Now with DDR3 technology, Kingston's HyperX® memory offers faster speeds and is backed by 100-percent testing and a lifetime warranty.

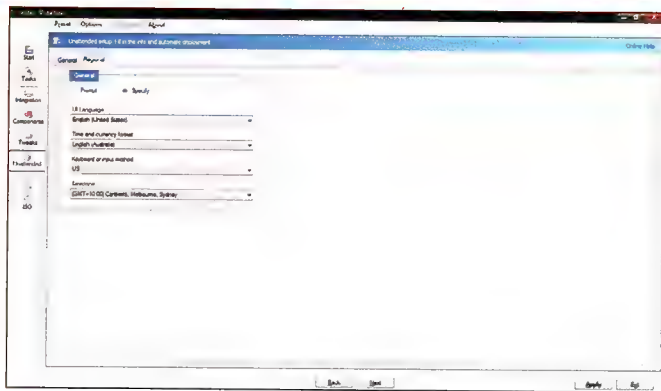
For more information, ask for HyperX by name at your local computer reseller or visit [kingston.com/hyperx](http://kingston.com/hyperx) today.



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▲ Regional settings, for those that don't know where they live.

Sample Pictures  
Screensavers  
Shell Event Sounds  
Sideshow  
Windows Calender  
Windows Photo Gallery

#### Network

Connect to a Network Projector  
Internet Information Services (*if you plan to not run a web server from your machine*)  
MSN Installer  
Remote Desktop and Assistance  
Remote Desktop Client  
Windows Collaboration  
Windows Mail  
Windows Firewall  
**Services**  
Computer Browser  
Distributed Link Tracking Client  
Error Reporting

Internet Connection Sharing  
DFS Replication  
Offline Files  
Volume Shadow Copy  
Windows Search

#### System

BitLocker Drive Encryption  
Malicious Software Removal Tool  
Manual Install  
Microsoft Agent  
Natural Language  
Parental Controls  
Security Center  
Sync Center  
System Restore  
Tablet PC  
Windows Backup  
Windows Defender  
Windows Easy Transfer  
Zip Folders

As you can see, there's a metric buttload of stuff you can just rip out. After cannibalising your Vista install in this manner you should be able to reduce the size of your image from 2.5GB to just 900MB. As an aside, most of this space is taken up by Media Center.

## Tweaking

vLite 1.1 beta sadly does not include an extensive set of tweaks, but the ones it does have are very welcome. Here are our recommendations as to what settings to use:

### Security tab

#### DEP (Data Execution Protection): Off

DEP has been known to cause certain programs to not function correctly. Atomicans are pretty savvy when it comes to viruses and the like, so protection from buffer overruns is overkill.

#### Disable AntiSpyware Realtime Protection: Yes

For the same reasons we turn off DEP, so do we get rid of this. We also reclaim some system resources.

#### User Account Control: Off

Do you hate how Vista asks permission to do pretty much everything? You do? So do we. Let's disable it before the OS is even booted.

### System tab

#### Hibernation: Off

It's unlikely you'll use this, ever, so reclaim drive space and turn this off.

## Power scheme: High performance

Make sure Vista doesn't throttle your CPU or drive speeds and whack this to high performance. Do this even if you're installing to a laptop, as you can always customise the setting in Vista later.

## Explorer tab

The settings here define what's hidden to you in Explorer's folder views. If, like us, you want to see everything, set all the 'Show...' entries to 'Yes'.

## Unattended activities


The second last tab in our adventure allows us to fully automate our Vista install, barring serious errors. The image above shows what options you should check – just replace the product key with a valid one and input your own username and password.

If you decide to skip the product key entry, the OS will still install, but you won't be able to download updates until you enter a key and have it verified. Of course, there's also the whole "30 days to activate" thing as well.

## Burn, baby, burn

Finally the configuring is done, leaving us with just two steps to go – applying the changes and creating a bootable ISO. If you're happy with your changes, hit the 'Apply' button in the bottom right corner of the screen. When the dialog box appears, select the 'Apply and rebuild' option. This will merge the hotfixes, and your changes, into the Windows image, reducing the overall size significantly. Depending on how many hotfixes you've applied and components you've removed (quite a few if you followed every step of ours), this can take some time, so go for a run or finish laundering your filthy lucre while it goes to work.

When it's finished, all you need to do is burn the image! You can either create an ISO for repeated use (which is what we recommend), or just write the image straight to disc.

With this completed, you'll have a much slimmer Vista install that includes the latest hotfixes. Keep it safe and handy, or, if you fancy a new OS install, give it a whirl. If you're not 100 per cent confident that things will go smoothly, you can always download Microsoft Virtual PC 2007 and test your disc before committing it to a real machine. VPC 2007 is free, so what are you waiting for? 

## NOTE

A few months ago, Microsoft released two beta hotfixes, KB938194 and KB938979, otherwise known as the 'Vista Compatibility and Reliability Pack' and 'Vista Performance and Reliability Pack' respectively. Each hotfix addressed a variety of issues, but we've included the most important here.

### 938194 Vista Compatibility and Reliability Pack

- Improves the performance in calculating the 'estimated time remaining' when copying/moving large files. Improves the performance when copying or moving entire directories containing large amounts of data or files.
- Improves the performance of Vista's Memory Manager in specific customer scenarios and prevents some issues which may lead to memory corruption.

### 938979 Vista Performance and Reliability Pack

- Improved reliability and compatibility of Vista when used with newer graphics cards in several specific scenarios and configurations.
- Increased compatibility with many video drivers.
- Improved visual appearance of games with high intensity graphics.

A note to earlier users – there was an incompatibility with vLite and these hotfixes that prevented users from creating or renaming new folders, if they were applied to a 'vLited' install. As of vLite 1.1 beta, this issue is resolved.



## INPUT OUTPUT

Fixing stuff no one else can, including God and your mum

# Howlin' Dan

You know, IO is more than just a moon. It's a magical place; send questions to [io@atomicmpc.com.au](mailto:io@atomicmpc.com.au), and Daniel Rutter will give you... answers!



INPUT OUTPUT

## It can't be pr0n if...

**I** My cousin overseas uploaded a video of a family reunion and it was so large, approx 230MB, that he RARed it into three parts and placed it on Rapidshare. I hate Rapidshare but I downloaded all three parts anyway.

First part opens up all right, but the other two give me an "archive is corrupted" error. My cousin said forget about most of the movie because it's only the first five minutes or so that I'm after, which should be in the first archive.

Can I extract the first part without having to mess around with the other parts because my cousin couldn't be bothered re-doing the movie so that all 3 parts work? I have got the first archive file in perfect condition sitting on my desktop.

Hucclie

**O** There's no technical barrier to extracting incomplete archives in several formats, even if you've only got enough data for part of a file. That means the file will be corrupt, of course, but if

it's a video format like MPEG you'll still be able to play it up until it runs out of bits.

Some archiving programs don't let you do this, but others do. WinRAR, for instance, has a simple "Keep Broken Files" checkbox in its "Extraction path and options" dialog.

## Windows 2.0 also a problem

**I** One might think that owning a laptop these days gives you the right to do with it whatever you see fit. It seems that Sony disagrees. With USB floppy drive and SATA drivers in hand, we installed an XP partition on a brand new Sony Vaio VGN-FZ15.

Much to our dismay, there are no XP drivers available on Sony's site, and a quick call to Sony revealed that they no longer support Windows XP at all.

Being quite industrious, we set about looking for our own drivers. A few hours later we came to the conclusion that such a quest was pointless. Even station-drivers.com (a well known source of

## I/O OTM wins a Logitech G5!

There's a mouse in the house. Okay, it's not in the house, it's in IO. And it looks damn good.



WHQL and beta laptop video card drivers) didn't seem to have drivers for the 8400GT under the hood of the shiny new laptop.

We couldn't even find detailed specifications about what is actually in it, so here I am, sitting in XP with no LAN, video, wireless or sound drivers. Touchpad works though!

Alex Kunzelmann

**O** No, it's not unreasonable to expect that you'll be able to run WinXP (or Linux, for that matter) on a new laptop.

But yes, you're screwed.

If your new computer comes with Vista on it, and especially if it comes with significant amounts of brand new tech (like the GeForce 8400 GT), it's still a good idea to first make sure that you can get drivers for an older OS.

Had you checked this before buying, you would have discovered that there are, as you've now found out, no WinXP drivers as yet for major components of some recent Sony laptops. It's quite possible that there will never be XP drivers for some of the hardware.

If you don't need to run very demanding applications under WinXP then you could try setting up a virtualisation package like Microsoft Virtual PC (which is free!). It'll run within Vista and present virtual hardware to a WinXP install that it'll be able to handle.

This is no good for big applications or 3D games, though.

## DFI DeadConductor(TM)!

**I** I have a DFI LanParty UT RDX200 CF-DR, which comes with onboard Karajan Audio. I also have an older Sound Blaster



▲ Realtek audio's perfectly fine these days but manufacturer still feel the need to hide it.

Audigy 2 ZS card, which was in my old PC, but hasn't made it across with the last upgrade.

I know that usually onboard sound is crap (read Realtek), but which is better in this case? My PC is due to be replaced once the quad core and DirectX 10 hardware settles down, at which point I will get an X-Fi or whatever is current.

In the meantime, is it worth putting in the Audigy 2 ZS?

Fraser Hand

**O** Congratulations! You've got Realtek anyway! DFI's 'Karajan' module is (as you know) a little separate plug-in daughter board containing the motherboard audio hardware, which stands perpendicular to the motherboard next to the audio sockets. In theory the separate board might give better isolation or a smoother power supply

or something; in practice, I doubt you'll be able to detect a difference.

The top-end Karajan modules, like yours, are based around a Realtek 'Azalia' ALC885 or ALC882; the ALC885's also used on the newer 'Bernstein' module; budget Karajans have the slower ALC850. The ALC885 is a very full-featured audio chip that provides a moderate amount of hardware acceleration for multichannel game audio.


The Audigy supports fancier EAX positional audio and effects modes, though, and ought to use even less CPU time in games, provided of course that it and its dodgy Creative drivers behave themselves on your system.

Both the ALC88x chips and the Audigy 2 are also High Definition Audio-compliant, able to play back up to eight channels of much-better-than-CD-quality audio; which would be great if you

actually have any applications that'll try to do that, which I bet you don't. I think you still can't get audio at a high enough bit rate for HD Audio to matter from anything but DVD Audio discs.

For every normal PC audio task except multichannel and/or positional game audio, the onboard Realtek audio (let's call it what it is) is perfectly fine. Cheap base-level Realtek chips may not have a terribly good reputation, but that's mainly because of motherboard design that gives a lousy final signal-to-noise ratio, or old drivers. The recent Realtek drivers have been very good.

If you want to use fancy EAX positional/environmental audio stuff in 3D games, then the Audigy 2 card can do stuff the Realtek chip can't, and will give you a slightly higher frame rate too.

Otherwise, if I were you, I'd stick with the onboard module. 

## I/O OF THE MONTH

### Wasted watts

**I** I'm curious as to the energy efficiency of a typical PC. How much of the power that goes in actually does 'useful' stuff like pushing electrons around?

It seems to me that PCs are very inefficient, with most of the power wasted as heat. Say the PSU is 300W and it's fully loaded. Where's the 300 watts going? Some gets converted to kinetic energy (spinning HDDs, optical discs, fans, maybe sound waves if you've got inbuilt speakers), some to light (the odd blinking LED). Practically nothing comes out in terms of electrical power (assuming no USB powered devices), as the only external connections (video, sound) only output milliwatts if that. So I figure 80 or 90 per cent of the 300W must be wasted in heat.

Just think about all the things in a PC that have heat sinks – CPU, GPU, chipset, RAM, some HDDs, PSU.

If you wanted to build a 'green' PC, what would be the most energy efficient design? Presumably a notebook type CPU/GPU?

Adam Webb

**O** Well, elementary thermodynamics tells us that all of the power that goes into any device will end up as heat. That's entropy for you.

The question you're really asking, of course, is how much power doesn't do anything useful on its way to heating up your computer room.

There are some household devices that really do waste considerably more power than they profitably use. Ordinary ceiling fans, for instance. They have horribly inefficient shaded-pole motors, and their flat blades don't move air very well either.

Most computer gear has a pretty good ratio of watts-consumed to instructions-per-second, though, and the ratio is getting better with each generation of CPU. A 66MHz 80486 only consumed a maximum of about seven watts; a Core 2 Duo working flat out may need ten times as much power. But the Core 2 may easily be doing

200 times as much work.

You can improve overall computer power efficiency by choosing components to avoid the ones with worse watts-to-work ratios – so a GeForce 8800GTS is preferable to an 8800GTX, for instance. You can also take advantage of the power saving features all modern CPUs have (I talk about that in [www.dansdata.com/askdan00021.htm](http://www.dansdata.com/askdan00021.htm), where I also talk about using laptop chips in desktop PCs).

For a given hardware and software configuration, though, the most important power consumption factor is the efficiency of the power supply.

That, generally, isn't great, though it's much better than you fear. The worst PC PSU ever made only wastes about four-tenths of the power it sucks out of the wall.

It's hard to pin down exactly how good, or bad, a given PSU will be in a given PC, because PSU efficiency varies with load. '80 PLUS' certification ([www.80plus.org](http://www.80plus.org)) guarantees at least 80 per cent efficiency at 20 per cent, 50 per cent and 100 per cent of a PSU's rated load; a really good PSU these days should be able to manage about 85 per cent in normal use.

In that case, a computer that needs 300 watts to operate will be drawing 353 watts from the wall.

Realistically, someone with a pretty hot gaming PC and an ordinary PSU can expect to save around twenty watts ([tinyurl.com/YVGNW](http://tinyurl.com/YVGNW)) by switching to a high efficiency power supply. It's possible to do considerably better, but you probably won't.

It'll take quite a while for a 20 – or even 40 – watt saving to add up to the price of a new PSU. You can save just as much power by turning off at the wall a few appliances (including PCs) that draw several watts when they're in "standby" mode.

If you're buying a new PC, though, it's definitely worth spending a few more bucks to get a more efficient power supply. All things being equal, an

80 PLUS PSU also ought to last longer than a cheap unit with the same rating. And that rating is less likely to be a complete lie, too.



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## TAFE or University?

Christopher Taylor gets down and dirty with the pros and cons of two very different styles of tertiary education.

So, it's come time to decide what you're going to do with yourself after you leave school. You're set on studying something to do with computers – coding, networking, whatever – but you're unsure whether you should be heading to TAFE or university.

If you speak to your school's careers advisor about it, you may be encouraged to aim for

university. When it comes to certain IT fields, there's a hell of a lot of merit in this advice. However, some schools do try and push their year twelves into university simply because it'll let them tell the parents of the next batch of prospective students that yeah, last year they managed to see X per cent of their charges head into flashy degrees. By all means listen to what your careers

advisor has to say, but keep in mind that it's really up to you to research what system better suits your needs, wants and style of learning.

### Educate yourself

One of the key points of difference between the two systems is what will be expected of you as a student. At university the tutors and lecturers aren't teachers – they're only there to facilitate your learning. They'll point you in the right direction, tell you what chapter of the textbook to read and answer your questions, but ultimately, it's up to you to get your shit together and learn. You won't be prompted – and you shouldn't need to be prompted – to take notes during lectures or hand the assignment in on time.

TAFE is nowhere near as harsh. While you won't be coddled anywhere near as much as you were in school, the system is, for the most part, a little more forgiving. In university, the only work you 'have' to do in most subjects is the assignments and the exam; they're what you'll be marked on. On the other hand, subjects in TAFE courses tend to have a lot of little exercises that get handed in at the end of each lesson. Perhaps in the long-run you end up doing more work in a TAFE subject than you do in a university one, but at the same time it's far harder to screw up in a major way because there's much more of an opportunity to find out if you're on the right track.

### Prac versus theory

Another point of difference is the balance of theory and practical work. TAFE is all about practical work, while university focuses more on the theory behind that practical work. Consider the example of a first year programming subject. In university, you'd spend an hour or two in the lecture theatre, hearing about how the language allows you to do x, y and z. You'd then go home and read the textbook, before heading into the computer lab for your hour-long tutorial to put the theory into practice. In



▲ You'll spend a lot more time doing practical work in a TAFE environment.



The larger universities will often have greater resources, but that is often traded off with less personal attention to individual students.

TAFE, you'd spend all those contact hours in the computer lab. While you'd still have a textbook, most of your learning would be a hands-on affair.

And that, in a roundabout way, brings us to one of the main problems with the TAFE system – you only have one teacher. If he or she is crap, well, here's hoping you're able to figure everything out for yourself based purely on what's in the textbook. With the university system, at least if your lecturer is crap you have a tutor you can turn too, or vice versa. Quality of staff, unfortunately, is a serious issue in both systems. Study IT and you might meet teaching staff that are intelligent and deeply passionate about their chosen field, but are completely and utterly incapable of communicating any of their knowledge to you and your class.

That being said, TAFE classes are typically a lot smaller than their university counterparts. It's easier to get to know your classmates and, more importantly, the person who's running the show.

## Money and time

Even with HECS and the option of deferring all payment until you're working full-time, going to university is by no means a cheap exercise. The price of a degree shouldn't be too much of a concern if you're going to end up in some well-paying computing gig, but it's worth keeping in mind if you're unsure if computing – or, at least, the field that's piqued your interest – is really for you.


If you're in this situation, TAFE may well be the solution. In terms of time and money, you invest a helluva lot less in a diploma than you do in a degree. Remember that once you're in a

course, it's plenty possible to upgrade to university if you really like what you're doing. Although it depends on the field, your prior studies should be recognised by the university. This 'backdoor into university' is also worth keeping in mind if you finish school with marks that won't get you into the degree you've got your heart set on. It's also possible to do a year or two of a degree and then make the switch to something else, so long as your marks are vaguely respectable, but that'd cost way more than simply doing a diploma.

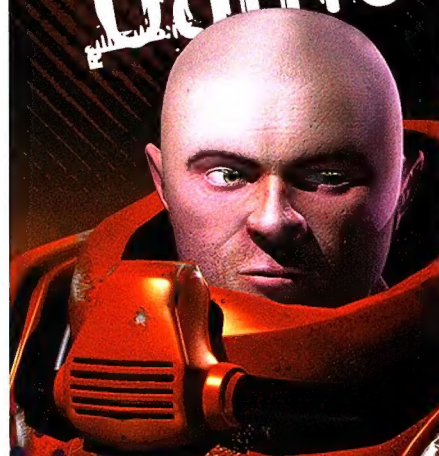
## Employability

Don't assume that doing a university degree automatically makes you more employable. In certain fields, yes, university is better, but some companies have a strong preference for TAFE graduates. Atomic forum user Caelum, for instance, was "head-hunted for [his] last two jobs".

"While this may or may not have been due to me going to TAFE," he said, "I think it has something to do with it. My previous boss was looking [specifically] for someone who went to TAFE due to the practical skills learnt."

Forum user kizk feels that TAFE is fine so long as you don't want to be a developer – unless you're looking for government work. Indeed, TAFE was deemed as being perfectly fine by most Atomicans we surveyed. That being said, university – as rightly pointed out by forum user BeDLam#29 – does impart more than just 'job skills'. Independent thought is held in the highest regard by universities, just as it is by many employers. 

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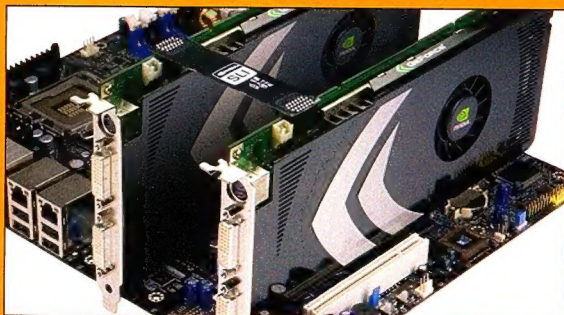
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It was the day of days. Cheers to Morris for the great shots.

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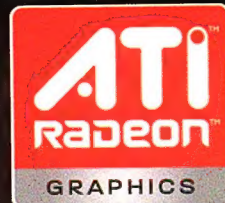
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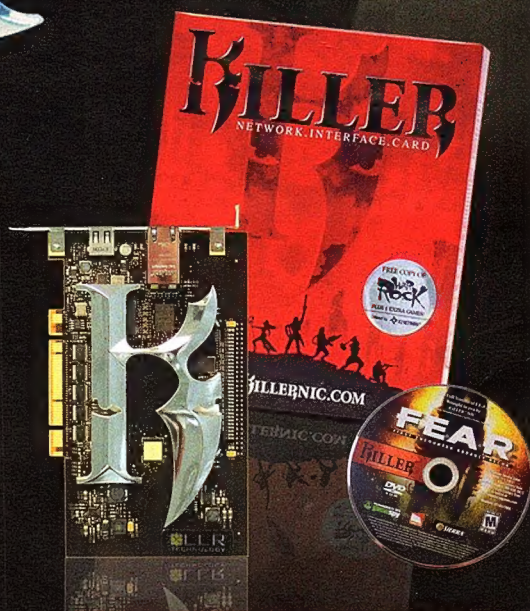


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